A COMMERCIAL GEOGRAPHY

ADAMS

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TWENTIETH CENTURY TEXT-BOOKS

EDITED BY

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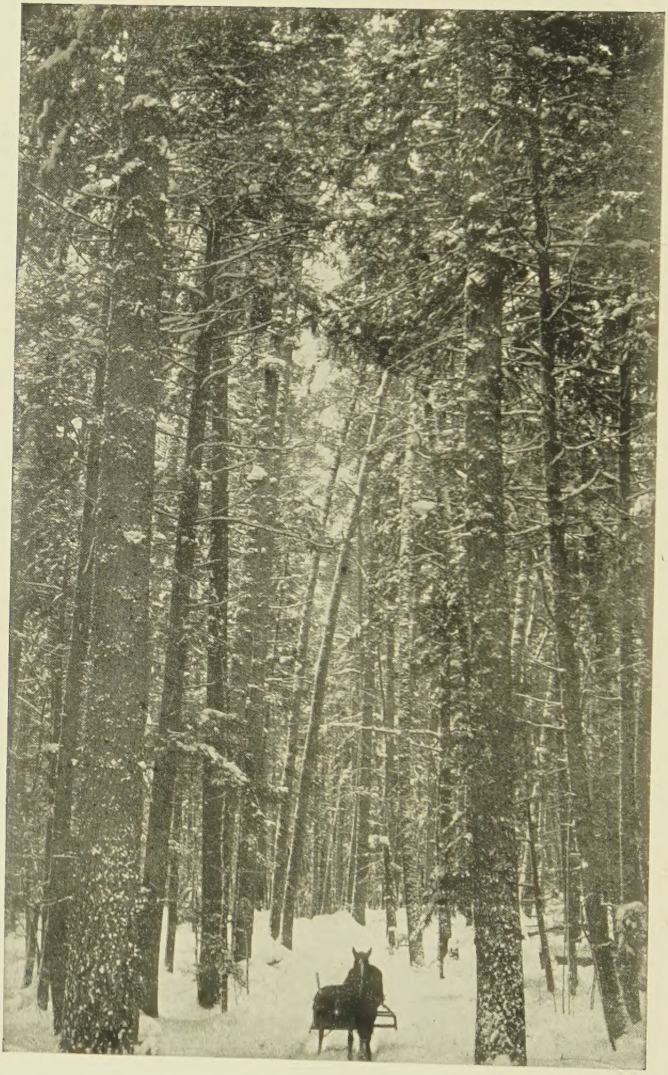


A PINE FOREST IN THE NORTH

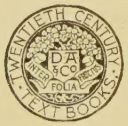
TWENTIETH CENTURY TEXT-BOOKS

A TEXT-BOOK OF COMMERCIAL GEOGRAPHY

BY

CYRUS C. ADAMS

"The greatest success in the world's commerce will be achieved by that nation that can make the most effective use of education, science, machinery, and natural advantages."



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1911

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PREFACE

The author has endeavored to limit the contents of this text-book of Commercial Geography to those dominating features of commerce and industry that should be most strongly impressed upon the student. The facts of commerce are treated as the effect of conditions that determine the quality and the quantity of trade. The effort is made throughout the book to connect cause and effect; to trace the great and small streams of commerce, and also to show the causes that give them direction and volume. Geographic and many other controlling influences, such as inventions, governmental aids or impediments, and the improvement of products, industrial processes, and means of transportation, are therefore made prominent.

As a large number of articles entering into commerce may more properly be treated in a handbook than a text-book of Commercial Geography, such, for example, as most of the two hundred by-products of petroleum, they are not even mentioned in this volume. The commodities entering most extensively into trade are sufficiently numerous, and attention has been confined to these commodities because they have a greater educational value in any attempt to elucidate for the classroom the nature of commerce and its underlying principles.

Each product is treated in the chapter relating to the commerce of that country in which the production or manufacture of the commodity is specially prominent. This plan is regarded as preferable to grouping products

under the heads of animal, vegetable, and mineral commodities, which would involve some weeks of rather tedious labor, of an encyclopædic nature, on the part of the student. Cotton and its natural distribution, for example, gain vital interest if treated in the United States, where cotton is most important, along with the facts relating to its manufacture and the general trade in it; while in England, Egypt, India, and Russian Central Asia cotton is treated only in its local application. A full index to all the information in the volume will be found useful for reference.

Comparatively few statistics are included in the text. The statistical tables, at the end of most of the chapters, relate to the subject-matter of the chapter to which they are appended; it is hoped that they will be found full of information, which, in small space, will helpfully supplement the text. No statistics have been used that are not believed to represent normal conditions; for this reason older data, in some instances, have been regarded as preferable to the latest information. No figures relating to some countries have been used; in Cuba, for example, statistical data relating neither to the period before the insurrection of 1895 nor to some years later represented normal conditions of trade, and they were not used.

The maps have been prepared with a view to illuminating the text, and conveying much information that could not otherwise be so graphically imparted. Most of them are compilations from a considerable number of official and other authoritative map sources, each contributing more or less data required for the purpose of the book. On a few maps, reproduced from foreign sources, the origin of each map is indicated on the margin. The maps of Latin America were collated with very little cartographic material, mainly from data derived from official sources and the consular reports of the United States. The author is specially indebted to maps in the Geographisches Handbuch

zu Andrees Handatlas, Leipzig, the Atlas Général of Vidal-Lablache, Paris, the Atlas für Handelsschulen by Dr. K. Peucker, Vienna, Lehmann and Petzold's Atlas, Leipzig, the Scottish Geographical Magazine and other publications for much data included in the maps of foreign countries; also, to the Department of Agriculture for the use of valuable illustrative material.

The manuscript and proofs of the book have been critically read by practical and experienced teachers, and their suggestions in regard to logical arrangement and methods of presenting the subject have greatly enhanced the pedagogical value of the volume for practical use in the classroom.

Miss Hedvige de Hutorowicz has prepared the index; she has also shared with the author from the first the large labor of collecting and collating the data obtained for the book from many countries and in several languages; he desires to express his appreciation of her assistance.

The authorities constantly consulted during the preparation of the book include the consular reports, statistical publications, maps, and other data published by the departments and bureaus of the United States Government; similar official publications of other leading commercial nations; the periodicals of many of the geographical societies, and particularly those of the American Geographical Society, the National Geographic Society, the Royal Geographical Society, the Scottish Geographical Society, the Imperial Russian Geographical Society, and the Societies of Commercial Geography in France; Petermanns Mitteilungen; Annales de Géographie; and Le Mouvement Géographique. Among other works that were consulted or read were: Appletons' Universal Cyclopædia; the Encyclopædia Britannica; Reclus' The Earth and Its Inhabitants; the Statesman's Year Book; the Almanach de Gotha; Hübner's Geographisch-Statistische Tabellen; Sievers' All-

gemeine Landeskunde; the Stieler and Andree atlases; Depew's One Hundred Years of American Commerce; Reports of the Chamber of Commerce, New York City; Cunningham's Growth of English Industry and Commerce in Modern Times; The International Geography; Keltie's Applied Geography; Mills' Elementary Commercial Geography and Atlas of Commercial Geography; Chisholm's Handbook of Commercial Geography; Herbertson's Commercial Geography of the British Isles; Lyde's Commercial Geography of the British Empire; articles in the Forum and North American Review; Hann's Klimatologie; Dorn's Die Seehäfen des Weltverkehrs; Kerp's Methodisches Lehrbuch; Geistbeck's Der Weltverkehr; Hahn's Die Haustiere; Wohltmann's Handbuch der tropischen Agrikultur; Schaufuss' Die hauptsächlichsten Erzeugnisse der Erde und ihrer Bewohner; Fitzner's Deutsches Kolonialhandbuch; Schmitz's Die Handelswege und Verkehrsmittel der Gegenwart; Supan's Grundzüge der physischen Erdkunde; Lüddecke's Deutscher Schulatlas; Duffart's Géographie Commerciale; Deville's Manuel de Géographie Commerciale; and Bourgoin and Foucart's Géographie.

CYRUS C. ADAMS.

May, 1901.

The revision for the present edition of this book has embraced all the maps and statistical and other data requiring to be changed to keep the volume fully abreast of commercial and industrial conditions. A considerable number of notes and questions have been added at the ends of chapters. They relate chiefly to man's efforts to profit by favorable and to overcome unfavorable natural conditions, the conservation of soil fertility, and some other topics.

C. C. A.

May, 1911.

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A R C T I C
O C E A N
Date Line
Bering Strait
A S I A
Bering Sea
Irkutsk
Vladivostock
Peking
Hongkong
Manila
PHILIPPINE IS.
Batavia
Monday
Sunday
NORT
Portland
San Francisco
Honolulu
TROPIC OF CANCER
Mazatlan
P A C I F I C
EQUATOR
SAMOA
SOCIETY IS.
TROPIC OF CAPRIC
O C E A N
AUSTRALIA
Perth
Albany
Melbourne
TASMANIA
Hobart
NEW ZEALAND
Auckland
Dunedin
CHATHAM IS.
Date Line
Monday
Sunday
COMMERCI
REGIONS AND HI
OF THE WO
Numerals on S.S. routes show in days the
Regions of largest Commerce.
Regions of important Commerce.
Regions commercially undeveloped.
Desert or unproductive Regions
Most important Railroads.
Rivers navigable for River Steamer
150 Longitude 120 West

1.

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COMMERCIAL GEOGRAPHY

CHAPTER I

THE BASES OF COMMERCIAL GEOGRAPHY

Man works to supply human needs. In his lowest state of culture man has very few needs, and supplies them all from the region where he lives. The dwarfs of Africa, for example, fashion their rude lances and bows and arrows with which they hunt, build only the simplest huts of boughs and grass to protect them from the rain, and wear no clothing, or at most merely the skin of an animal or a bit of grass cloth. But as man advances in civilization he requires a greater variety of food, better shelter, and comfortable clothing; and in his highest state of culture his wants are very numerous, and he draws not only upon his immediate surroundings, but upon the whole world to supply them.

The materials used by man are obtained either directly or indirectly from the soil or from rock and mineral substances. The larger part of them are derived directly from the soil, such as cereals and other vegetable food; trees, bamboo, and those vegetable products which supply the principal material in house building; also cotton and other fibers from which cloth is made. Many necessaries also are supplied by land and sea animals whose flesh, fat, skins, bones, wool, and hair are utilized by man. All these animal commodities are derived indirectly from the soil, for the reason that the food of all animals is vegetation or other

animals that eat plants. Another large source of necessary commodities is rock and mineral substances, such as coal, iron, and the precious metals, that are dug from the earth.

Natural riches are very unevenly distributed. Civilized man must go far for many of the things he needs. There could be no vegetable life without the heat and light that come from the sun. As heat and sunshine are unequally distributed over the earth, they produce differences of climate and consequently many varieties of vegetation, as, for example, the wheat of the temperate zones and the cotton and rubber plants of warmer regions. Some regions also are far poorer in useful rocks and minerals than others. Thus Holland has no building stone, Switzerland no coal, and the United States much less sulphur than it needs. Each country, therefore, must sell commodities in which it is rich and buy commodities in which it is poor.

Commerce is the exchange of commodities. The causes that give rise to commerce are (1) the differences in the productions of various parts of the world, making exchanges necessary, and (2) the division of labor among men. Thus Argentina, poor in iron and coal but rich in wheat and cattle, sells grain, meat, and hides in other countries, and buys their iron manufactures and coal. If everybody should produce food, and make coats and boots, there could be no commerce in these commodities, because each would supply his own need; but when one man produces only food, another coats, and another boots, the necessity for trade arises. So the difference in the commodities produced by different regions, and the division of labor have compelled man, in every stage of culture, to engage in trade. The Congo fisherman exchanges his dried fish and the African dwarf his fresh meat for vegetable food supplied by the surrounding tribes. But it is only highly civilized nations that develop world-wide commerce.

Commercial geography describes the world in its relations to man as a producer and as a trader. It tells of

the geographic and other conditions that help or hinder man in his efforts to produce commodities or to buy and sell them. Thus the slope of the land determines the direction of the rivers, and whether they may be utilized to carry commodities to market. Mountain ranges hinder commerce so far as they tend to keep peoples apart and increase the cost of transportation. Valleys and plains are the great sources of food for man and his domestic animals. Mountain regions are the largest sources of the metals and minerals he uses. The luxuriance and variety of vegetation decrease from the equator toward the poles, and from sea level toward high altitudes. The ocean supplies fish and salt, and is the cheapest highway of commerce. All these natural conditions have a direct bearing upon the needs of the merchant. He wishes to know where he may procure his commodities in large and regular supply at reasonable prices and at low cost of transportation. Commercial geography therefore treats of the many influences operating all over the world which promote or retard the production, transportation, or exchange of the commodities, natural or manufactured, which man consumes or utilizes. The facts of commercial geography prove that the world has become a vast trading community through the discovery and perfecting of rapid and cheap communications; that the invention of machinery and other appliances has multiplied many fold the capacity for production, so that the United States, with one fifth the population of China, has a greater productive capacity than that country; and that the division of labor makes experts in all lines of production, thus improving the quality, increasing the quantity, and thereby decreasing the cost of commodities.

CHAPTER II

NATURAL CONDITIONS AFFECTING COMMERCE

Climate

Climate is the largest influence in determining where animals and plants may thrive. The volume of trade and the directions it takes are greatly influenced by climate. Large commercial relations can exist only between large populations, and these are found in those temperate or tropical regions that are best adapted to support human life. Man can not thrive in the rarefied air of high mountain regions, in the severe cold and long darkness of the polar zones, or in the parched desert; consequently such regions have small population and little commerce. Men from more favored lands are tempted to go to them only to secure some great natural resource, such as the right whale of the Arctic, the gold of the upper Yukon, or the nitrates in the desert of northern Chile.

Climate influences agriculture more than soils do. Similar climates have similar vegetation the world over, but there is a wide difference between the products of similar soils in one climate and in another. The larger part of the Sahara and nearly all of the Gobi plateau in Asia need only greater rainfall to fit them to support abundant life. North Canada, the polar lands, and Tibet, the loftiest tableland in the world, need only higher temperature to make them teem with vegetation. On the other hand, high temperature and excessive rainfall combine to produce too luxurious vegetation in the forested Amazon basin and in the forest

belt of equatorial Africa, rendering them comparatively unfit for agriculture; while the hot and steaming atmosphere promotes fevers that render such regions almost uninhabitable. Malaria is usually developed in hot, marshy districts. No large industries, except mining, no commerce, except in mineral products, can thrive where climate does not permit large agriculture or animal raising. The greater part of Australia would never have any importance in the world's trade if it were not for irrigation and the gold and other metals and minerals found in its rocks.

Temperature is one of the two most important climatic elements. Temperature depends chiefly (1) upon distance from the equator—in other words, geographical latitude—and (2) upon elevation above sea level. The effect of latitude upon temperature and consequently upon life will first be considered.

Typical tropical regions have the greatest luxuriance of plant and animal life. This is due to the excessive heat and moisture of these regions. Trees and many lesser plants are giants in stature. The largest of wild beasts roam through the forests or jungles. Staple foods, such as the banana and cocoanut, grow wild, and little shelter or clothing is required; man's wants are few; his mind and body are not stimulated by the need of a struggle for existence, and he has little ambition or energy. Many tropical countries, therefore, could have little part in commerce if they did not produce fruits, food stuffs, and raw materials for manufactures that are largely demanded in other lands.

The polar regions are poor in plant and animal life. They present the other extreme of climate. The Antarctic is not tenanted by man. The arctic Eskimos require abundant food, clothing, and shelter, but the materials for providing them are scanty. Most of the land is buried under snow and ice, and for half the year the gloomy landscape is not cheered by a ray of sunlight. The natives are clad in skins of animals which they kill for food with

weapons fashioned from bones and walrus ivory. Their huts are made of snow, ice, stones, and skins. The struggle for a bare existence is intense, and man is content if the severest exertion will provide him with sufficient food and warmth. His grim environment schools him in hardihood, patience, and stolid endurance; but only in south Greenland does he gain a little store of oil and eider down to exchange for foreign commodities.

The temperate zones afford the golden mean of climate. They lie between the climatic extremes. Man thrives best in the temperate zones because genial conditions of life abound there, imparting physical energy and vigor of mind. Hard work with hand and brain brings out the best that is in the human race and lifts it to the highest plane of development. Industry and invention multiply the comforts of life, so that man produces a far greater variety of desirable things, and buys and sells many more kinds of commodities than the people of the other zones. Thus it happens that by far the larger part of the world's commerce is between the busy farmers, manufacturers, and other laborers who inhabit the coasts and fertile plains and valleys of the temperate regions.

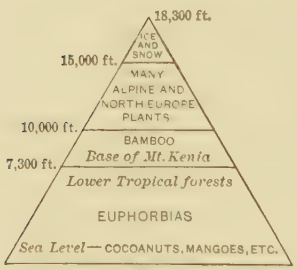


FIG. 2.—Showing the effect of altitude in distributing vegetation from the tropical sea level to the frigid summit of Mt. Kenia, under the equator in East Africa.

Temperature decreases vertically 1° Fahr. for every 300 feet of elevation above the sea (Fig. 2). Temperate or frigid climates are therefore found in the higher parts of the tropical zone. In Ecuador the lowlands yield rubber and other tropical products, the Andean uplands produce wheat, and the summits above them are capped with snow. The equator crosses both the Congo and Amazon basins, but most of the Congo system is much

higher above the sea. This is one reason why the Congo has a larger population and a more rapid development of commerce.

Rainfall is the second most important climatic element. The sea is by far the largest source of rain. The amount of rain on the land (Fig. 3) varies with the distance from the sea, so that the rainfall of the far inner parts of the continents is much less than near most coasts. It also varies with the direction of the prevailing winds; so that, for example, the Sahara and southwest Africa are deserts because the prevailing winds blow toward the sea instead of from it, and consequently are always dry; while the Amazon valley is drenched because the northeast trade winds incessantly pour over it the water brought from the sea.

Winds are transporters of climate. They carry heat from the tropics to the cooler regions, and the icy temperature of the polar areas to the warmer latitudes; they also distribute rainfall over land and sea. Thus they have an important influence in fixing the abodes of man and the regions of his commercial activity.

The sea climate is more equable and mild than the continental climate. This is so because the air over the land becomes much hotter or colder than the air over the open sea. Thus land near the ocean has a more equable climate than land in the interior; but the continental climate may be extended to the coasts as on the Atlantic seaboard of the United States, if winds from the interior sweep unimpeded to the ocean. The heat conserved by the ocean tempers the air currents moving over it; and as the prevailing winds over the north Atlantic move eastward across the ocean they distribute over northwestern Europe the moderate temperature they have derived from the Atlantic; so that barley thrives far north in Norway and its ports are open the year round, while Labrador, though much farther south, is bleak and barren most of the year

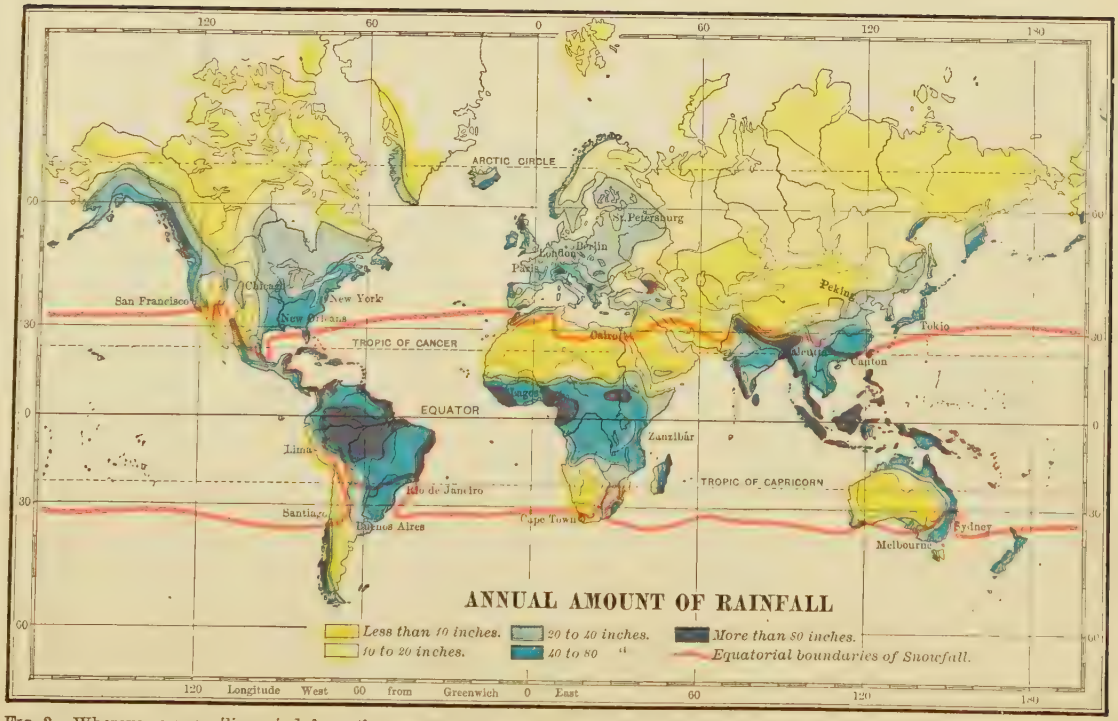


FIG. 3.—Wherever a prevailing wind from the sea (Fig. 8) meets a mountain chain there is heavy rain, while on the inland side of the chain there is little or no rain, as in Scandinavia and western North America between San Francisco and the Alaskan peninsula. Along some coasts, as in Lower California, Peru, and northern Chile, the prevailing winds blow toward instead of from the sea, with the result that the coasts have very little rainfall and consequently little development.

because the prevailing winds come from the arctic interior of northern Canada instead of from the sea. Ocean currents, such as the warm Gulf Stream and the cold Labrador current, contrary to earlier opinion, are now believed to have little influence upon the temperature of the land.

NOTES AND QUESTIONS

Everywhere we see men trying to counteract the influences of climate that are unfavorable to production and commerce.

For fifteen years United States surveyors have been measuring the quantity of water supplied by rivers in our arid regions (page 50) and searching for places where the waters may best be collected in reservoirs for irrigation. In 1903 the work of building reservoirs began, and it was estimated that these public improvements will finally turn about one-twentieth of our dry lands into very fertile farms.

What is the probability of making any desert region in the world richly productive if sufficient water may be supplied? (See index, *Irrigation*; and *Sahara*, page 461.)

Why do the daily reports, issued by the United States Weather Bureau, have precedence over all other telegraphic business? How are its reports useful to the shipping in our sea and lake harbors? How do cold wave, frost, and storm predictions affect the planting and harvesting of crops?

Observe, in the next great flood, whether the flood warnings of the Weather Bureau facilitate the saving of property. (Daily newspapers and *Monthly Weather Review*.)

What is the effect of a prolonged drought upon the production and prices of meat, butter, fruit and vegetables? Would such a calamity increase the demand for and prices of canned goods?

What kinds of goods are in great demand at increased prices in prolonged wet periods?

At what time of the year is the demand for heavy woolens greatest at Boston, New York, and Chicago?

Why is much coffee grown under the shade of trees in Porto Rico, Venezuela, and many other countries? (page 344.)

A new enterprise is developing in our country: The raising of strawberries and vegetables in winter to supply the winter market with fresh food. New England is very cold in winter, but Massachusetts is supplying Boston with cauliflower and other garden-truck throughout the year. The Middle Atlantic States are sending fresh small fruits and vegetables to New York and other cities in January. How is it done?

New York began, in 1903, to import in March fine peaches, plums, apricots, and other fruit from Cape Colony. How can South Africa raise fruit for our early spring markets? How can such perishable freight be transported 9,000 miles without spoiling? (page 472.) What is the advantage of Bermuda to our markets? (page 387.)

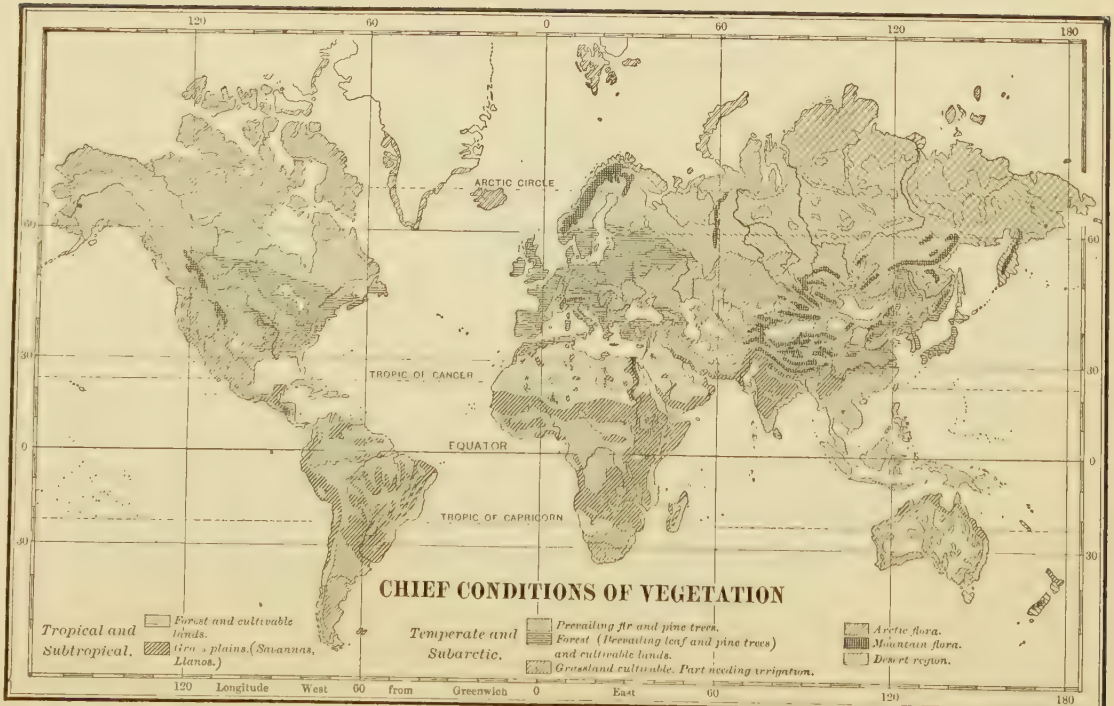


FIG. 4.—This map shows the distribution of forest, cultivable, and grass lands to which the larger part of human occupations are confined. Regions of fir, pine, and leaf trees supply lumber, grass plains nourish flocks and herds, and cultivable lands produce farm crops. Mountain flora, close to or above the snow line in all latitudes, is of an Alpine character.

CHAPTER III

NATURAL CONDITIONS AFFECTING COMMERCE

The Influence of Soils, Forms of the Earth's Surface, and Ocean Currents and Winds

Good soils are required to produce luxuriant plant life. Vegetation needs not only the carbonic acid it draws from the air, but also certain mineral substances in the soil which are plant food and are taken into the plant for its nourishment by the water that ascends from the roots. Soils are composed of particles worn away from the masses of rock and mixed with plant and animal remains. A poor soil contains little of these food substances and so yields little vegetation; or it may be rich in food substances but is of such a nature as to prevent water from doing its part as a carrier of plant food. Very sandy soils, derived from crystalline rocks, such as granite, do not retain much moisture and are therefore unsuitable for thriving plant growth. Clay soils, derived from feldspar

Fig. 5.—Contrasted areas in France.

In one of these districts the houses and hamlets are widely dispersed, for all may easily obtain water, as an impermeable rock stratum beneath them keeps most of the water near the surface. In the other district the water, sinking deep through permeable rocks, is hard to get, and the population is grouped around deep wells.

FIG. 6.—Only main cable and telegraph routes are shown. Several cable lines, for example, extend along some routes indicated between Europe and North America, there being in 1903 fourteen lines between these continents.

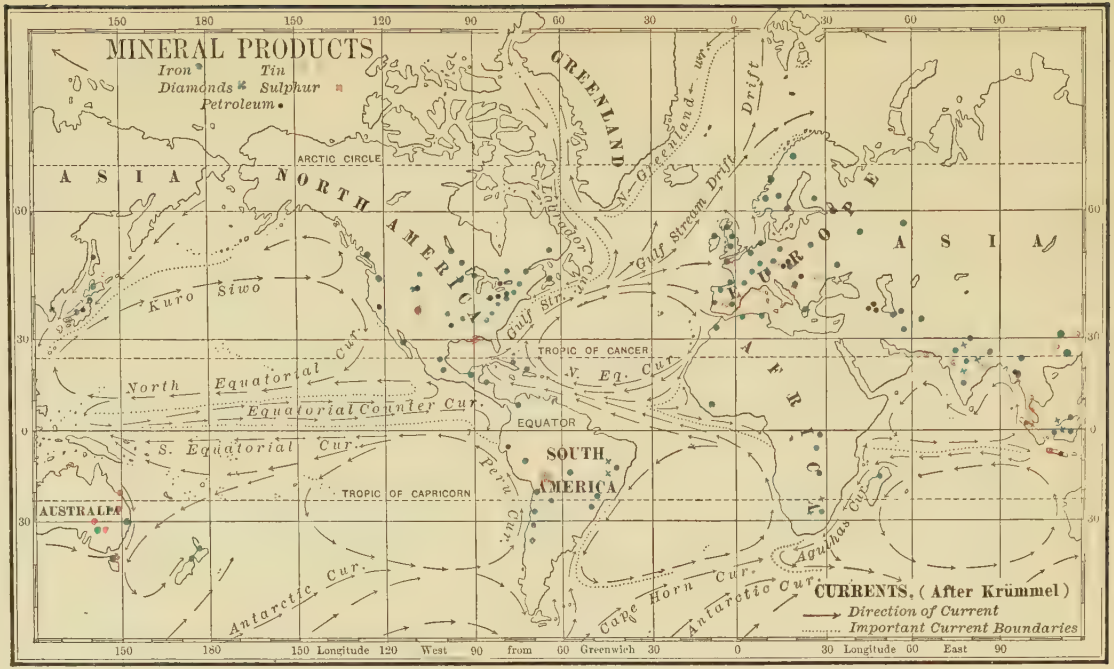


FIG. 7.—This map indicates only regions where mining industries are actually carried on. There are large coal-bearing areas in the United States and elsewhere, for example, not yet worked nor adequately defined. The great plains in all continents are comparatively poor in mineral commodities, which are mainly derived from mountain regions.

and some other minerals, are so heavy as to interfere with the circulation of water and air, and so are not favorable for agriculture. When sand and clay are mixed with an important quantity of plant and animal remains a loamy soil results, and this is best adapted for general agriculture (Fig. 4). Rocks and minerals also influence human life in various other ways. Their nature often determines the location of houses and towns (Fig. 5). The growth of London toward the north was retarded until water was conveyed thither in pipes, because the underlying rocks do not retain the rainfall. Over the great plains of Russia, Hungary, South America, and in Holland no building stones are found, and these countries are thus deprived of a large source of wealth. Villages may be thickly sprinkled over some particular geological formation, as on the upper greensand in England, noted for its fertility, or along an outcrop of the coal measures. The distribution of minerals over the earth has an important influence in the distribution of the human race, attracting a large population to mountain districts which would be almost uninhabited if it were not for the metals found in them (Figs. 6 and 7). Not only the nature of rocks, minerals, and soils, but also the forms of the land have great influence.

All forms of the earth's surface promote or hinder trade. These topographical features, the slope of the surface, highlands, lowlands, rivers, and the character of coasts have a marked effect upon the accessibility of regions, the occupations of men, and the density of population. Behind Amoy, Fuchau, and all other ports in southeast China, for example, are parallel mountain ranges that are not easy to cross. The importance of all these ports is diminished by the fact that these impediments prevent easy communications with the distant interior where millions of buyers and sellers live. Thus mountains may obstruct commerce. Let us see how the forms of the land may affect human occupations in various ways.

The slope of the land influences production. The sun's light and heat have most power within the tropics because there the solar rays fall nearly or quite vertically upon the earth; and they become less and less powerful the greater the distance from the equator, for they fall upon the earth more and more slantingly; but in any latitude where the land presents a sloping surface to the sun it receives the solar rays in a more vertical direction, and consequently has more warmth than surrounding surfaces that are flat or slope away from the sun. This is why in the northern hemisphere farms and hamlets cling to the southern slopes of the lower Himalayas, while the northern slopes are almost uninhabited; for the same reason the apple orchards of the United States and Canada are planted preferably on the southern slopes. In the southern hemisphere also the vineyards of Cape Colony and the peach orchards of New Zealand are planted on the northern slopes. Though latitudes far from the tropics have less intensity of solar heat, the days of the summer or growing season increase in length with distance from the equator, till at the poles there is continuous sunlight for six months. Hence in high latitudes deficient intensity of solar heat in the growing season is partly repaired by longer duration of sunlight; maize, which requires much warmth, may be ripened in southern Canada.

Mountain ranges have great influence upon climate, political geography, and commerce. Many of them form climatic boundaries. The Cordilleras of western America and the Scandinavian mountains arrest the warm, moist western winds which rise along those great rock barriers to cooler altitudes, where their water vapor is condensed and falls as rain, so that the country on the windward side of the mountains is wet and that on the leeward side is dry. Mountain chains stretching east and west across central Asia protect the southern part of the continent from frigid arctic winds. The large winter tourist traffic of the Riviera is due to the mountains that shield this favored

French-Italian coast from the north and northeast continental winds, giving it a considerably warmer winter's temperature than that of Rome, two and a half degrees farther south. As North America has no mountain barriers across the pathway of polar winds they sweep southward even to the Gulf of Mexico, and have twice destroyed Florida's orange groves within a decade. Mountain ranges are conspicuous in political geography because they are the natural boundary between many nations and languages, as the Pyrenees between France and Spain, the Alps between Austria and Italy, and the Himalayas between Tibet and India. Mountains sometimes guard nations from attack by the isolation they give and therefore promote national unity. Thus the Swiss are among the few peoples in Europe who have maintained the integrity of their state. Commercially, mountains are of great importance as a source of water, which they store in snow, glaciers, and lakes. Snow and ice, melting slowly on the mountains, are an unfailing source of supply for perennial rivers and thus promote navigation. Mountains are the largest source of water power, which is more valuable than ever now that electricity is employed to transmit it to convenient centers for use in the industries. A large part of the mining machinery in the United States is run by water power. Switzerland, which has no coal, turns the wheels of its mills with water. Mountains supply most of the metals and minerals, and are therefore the scene of the largest mining industry. They are also among the greatest sources of forest wealth. Though the slopes are not favorable for agriculture they afford good pasturage, and the debris of the rocks washed into the valleys and plains by mountain torrents supplies good soil. Thus the Appalachians have been worn down to a comparatively low level, and the soil formed from their rock particles is the basis of large husbandry. The scenic attractions of many mountain regions is a source of large revenue. The Alps attract crowds of tourists who spend

about $20,000,000 a year in Switzerland and Austria, and give employment to many thousands of persons.

Rivers provide cheap transportation and rich soil. Farms, towns, and factories may be pushed inland nowhere so easily as along rivers that supply navigation. Their valleys may be more easily developed than other regions because water freightage is less expensive than any other form of land transportation, and thus communications with markets and the sea are easily maintained; also because the valleys, enriched by the alluvium which the rivers, at flood, spread over them, supply abundant food. Thus rivers are the lines of least resistance to the advance of man; and their valleys are settled first when man begins to carry his industries and commerce inland from the sea. As civilization developed first along the great rivers, the Nile of Egypt, the Euphrates and Tigris of Mesopotamia, the Ganges and Indus of India, and the Hoang and Yangtse of China were the creators of history. Rivers are the transporters of fertilizing alluvium from the highlands and mountains where they rise to the lowlands through which they flow. Thus a large part of Holland is the gift of the Alpine regions transported by the Rhine. The Saskatchewan of Canada is heavily charged with alluvium from the Rocky Mountains, and the widest zone of arable lands on the Canadian plains is in its basin. The estuaries of rivers, as those of the Delaware in the United States, the Thames and Clyde in Great Britain, the Elbe in Germany, and the Gironde in France, enable sea vessels to penetrate far into the land, and their great importance is shown by the large commercial and manufacturing cities on their banks.

Plains and valleys facilitate transportation and stimulate manufactures. If they are fertile the tendency is to populate them densely because agriculture thrives, and also because, transportation being least difficult, they offer special facilities for the development of factory industries which need to bring in raw materials and to send out manufac-

tured products at small cost for carriage. Their advantages are enhanced if they are near the sea, so that the great ocean highway of commerce may easily be utilized; and also if they are near large supplies of coal, which is the greatest source of power in the manufacturing industries. Thus the densest populations are found on fertile plains, particularly along the seacoasts, but also as far inland as the prairies of Illinois and Minnesota; or in fertile valleys, as along the Nile or in the Yangtse basin; and in these areas of largest population are many centers of special density where Nature has placed coal, or where the most convenient, accessible, and excellent sites for cities and harbors are found. There are also wide plains, far inland, which do not have sufficient rainfall to nurture the growth of forests or cultivated crops. Grass takes the place of the larger vegetable growths. These grass areas are called by different names. They are steppes in Euro-Asia, where they extend from Mongolia through southern Russia into Hungary; the great plains in North America, where they stretch from the middle of the Dakotas and Texas to the Rocky Mountain plateau; downs in Australia, pampas in the Argentine Republic, llanos in Venezuela, and savannas in other tropical regions. These plains develop the pastoral life, and a dense population is never found in regions where grazing is the chief pursuit.

The isolation of islands sometimes promotes commerce. Thus the insularity of Great Britain saved that country from the ravages, in the Thirty Years' War, that devastated half of Europe. Before that time Flanders and Germany had surpassed Great Britain in many lines of trade and manufactures; but, thereafter, she had nothing to fear from continental competition. The insularity of the Japanese, also, has promoted the peculiar and advanced civilization that is developed among them.

Coasts help commerce if they afford protection from heavy waves. This is the case along a great part of the broken

shore line of Europe, where there are many harbors. The vast development of the European sea trade is partly due to these coastal indentations, many of which extend far into the land. The broken Atlantic coast of the United States provides numerous harbors, and is far more favorable to commerce than its high and rocky Pacific coast, exposed to the full fury of gales, with only a few places of shelter. Population is less dense on coasts with few harbors because commerce is thus restricted, as on the south coast of Sicily, where the waves beat against an almost unbroken wall of rock, and most of the islanders therefore settle nearer the other coasts where there are opportunities for maritime enterprise. Such high, unbroken coasts exposed to storms are a danger to navigation. Low, sandy coasts rising from shallow seas are also a danger, as on the west and north sides of the Gulf of Pe-chili, where the Chinese engage almost exclusively in agriculture and inland trading because their coast is unfavorable for sea trade.

Ocean currents and winds help or retard navigation. As ocean currents (Fig. 7) are caused largely by the prevailing winds they have about the same course over the sea. A vessel sailing from the Isthmus of Panama to the Philippines, for example, is steered into the equatorial current flowing west and may gain forty miles a day, while it might lose thirty miles a day if it were sailed in the eastward flowing equatorial counter current. Winds (Fig. 8) affect the speed even of modern steamships, and the routes of sailing vessels are shaped by them. A clipper ship from England for Australia, for example, skirts the coast waters of Europe and Africa to the northeast trades, sails before this wind to South America, and follows its shores southward out of reach of the southeast trades to the westerly winds, which carry her due east to Australia. On the homeward voyage these same westerly winds carry her east past Cape Horn and to Africa, where she strikes the southeast trades that take her over to the American coast, where she travels in-

shore to avoid the northeast trades till she meets the anti-trades or westerly winds that help her home. Sailing vessels with ample sea room make good but retarded progress by tacking against the wind. The tropical whirlwinds, called

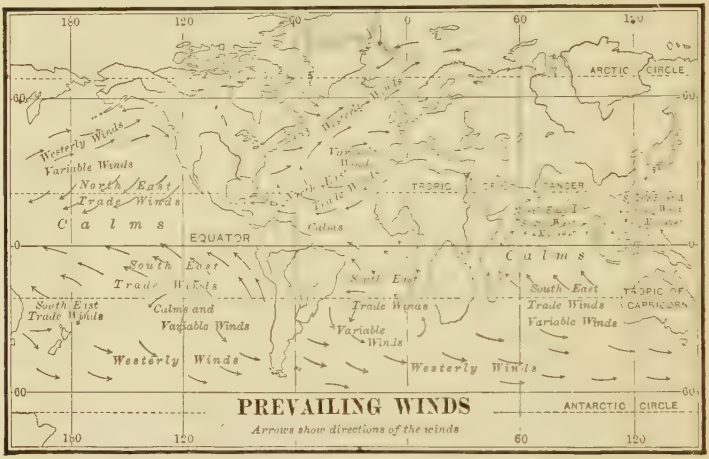


FIG. 8.—The prevailing winds that most influence navigation are: (1) The northeast and southeast trade winds, blowing steadily the year round, but shifting their position to some extent; (2) the dry north monsoon which, in winter, blows from the south Asian lands over the Indian Ocean and the south China Sea; and the moist south monsoon which in summer blows from these seas over the lands; (3) the anti-trade or westerly winds between the fortieth and fiftieth parallels in both hemispheres. The westerly winds of the southern hemisphere (the Roaring Forties of the sailor), unimpeded by land, make the royal road of sailing ships from Australia east to the Cape of Good Hope.

typhoons in the monsoon regions and cyclones elsewhere, sometimes do much damage to shipping and ports; and the great waves raised by high winds in the shallower coast waters are also among the dangers of navigation.

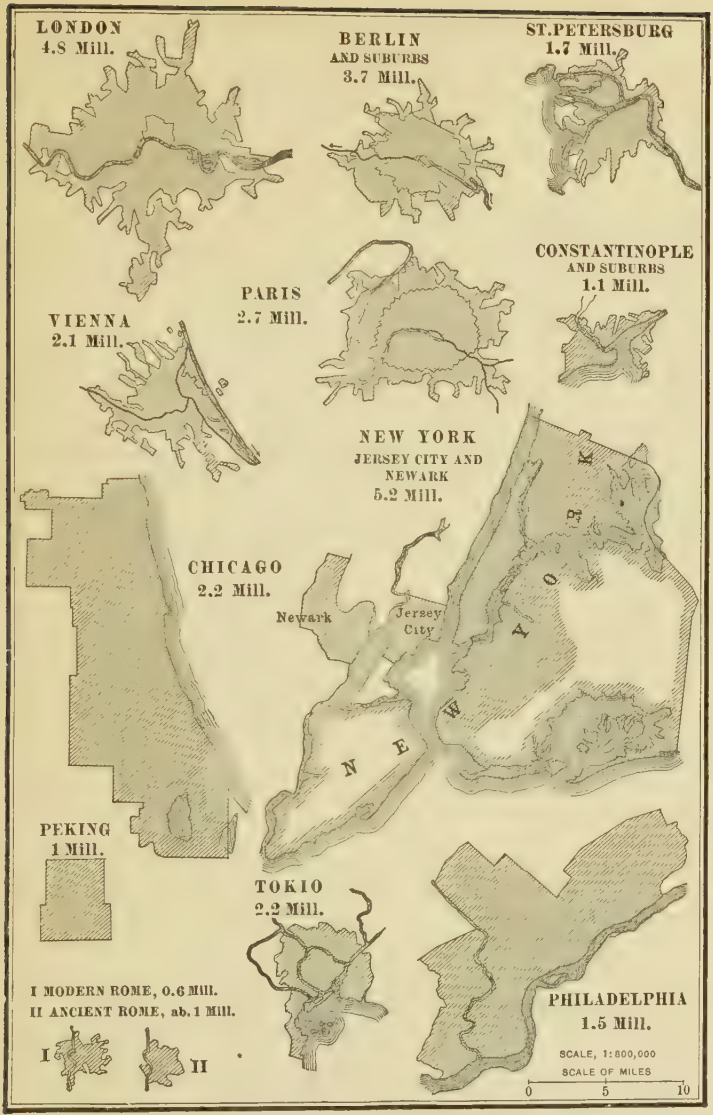


FIG. 9.—COMPARATIVE SIZE OF LARGE CITIES.

London, Paris, Berlin, and Vienna have each spread out along market highways for miles beyond the main body of the city. The English drew a line around the outer limits of these narrow extensions of London and call the circumscribed area "Greater London," which has a population of over 6,000,000, or 2,000,000 more than London county. The comparatively small area and large population of Constantinople and Tokio illustrate the wretched overcrowding of Eastern cities. Peking has the least irregularity of outline, and the fact that it remains cramped within the rectilinear city walls is evidence of stagnation of business and lack of enterprise.

CHAPTER IV

NATURAL CONDITIONS AFFECTING COMMERCE

Influences that determine the Position of Town Sites and Harbors

Towns and cities are centers for the manufacture, storage, and sale of commodities (Figs. 9 and 10). Any situation offering special advantages as a place where business men may conveniently meet or commodities may be cheaply manufactured or easily exchanged is likely to be occupied by a town or city. These settlements attract most of the mills and workshops, for labor is abundant there, and the railroads and other trade routes which converge upon the larger centers of population give them superior facilities for securing raw material and shipping products. Many small towns are scattered everywhere in well-populated regions because it is convenient to have small trading facilities near at hand, but the largest commerce is confined to large cities. They also promote civilization, for large sums of money are used to establish public libraries in them and to foster art and science.

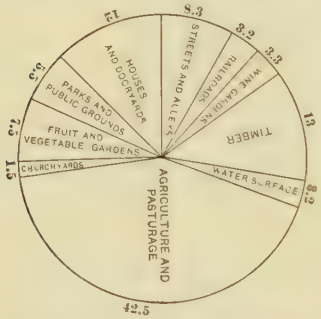


Fig. 10.—Showing, in percentages, the uses to which the area within the city limits of Vienna are devoted. Most cities have, for future growth, large areas still unoccupied by buildings or streets.

Cities are built at places that are most accessible and near to sources of natural wealth. Thus the place where trade routes meet or toward which they converge is a convenient center for business and a town or city rises there. It was this consideration that fixed the position of Paris (Fig. 11). Vienna is also the meeting point of great trade routes that follow the valleys from the plain of Silesia, far to the northeast, from the highlands of Bohemia to the northwest and from the wheat lands of Hungary to the southeast. The situation of Vienna is thus a natural trading point, and so a city developed there.

FIG. 11.—River valleys converging on Paris marked it as a central point of trade, for merchandise could be distributed in all directions from Paris by boats; and boats brought commodities from the surrounding country to the central market.

Towns or cities rise at the mouths of navigable rivers where goods are transshipped between the sea and land routes, as at Norfolk, Havre, and Danzig. The cost of transportation in ocean vessels being less than the cost by land routes, many large seaports are placed as far inland as possible at the head of estuaries or on deep rivers, as Baltimore, 140 miles, and Philadelphia, 120 miles from the sea.

Such cities as Pittsburg, St. Louis, Lyons, and Hankau become very important primarily because they stand at the confluence of navigable rivers, making it easy to distribute or to collect freight over a wide area. Cities were certain to rise at Albany and Troy, Bangor, St. Paul, and Duluth because they are at the head of navigation, where freight must be transferred between water and land routes. Men must live at such places to handle the freight. Farmers bring their produce for shipment by water. Dwellings, eating houses, blacksmith shops and stores are required,

and a town is sure to rise. Towns or cities are founded at great river bends, because much of the river freight is not destined for points in the new direction which the river takes, but must be transshipped; and this need gave their start to Cincinnati on the Ohio, Kazan on the Volga, and Timbuktu on the Niger.

Waterfalls and rapids have given rise to many manufacturing towns, as Minneapolis and Lowell, because the power they supply is used to run the mills. Many cities owe their greatness to their central position in exceedingly productive regions, as Chicago, which has the further great advantage of being one of the Western termini of the lake and canal routes to the Atlantic; and Indianapolis, which is a collecting and distributing point in the center of the corn belt. Moscow and Berlin are also in the center of great plains where trade routes converge; and their central position also gave them political importance, for they were made the capitals of large countries.

FIG. 12.—French enterprise has given Algiers, which had only anchorage ground, a fine harbor by means of long breakwaters inclosing a large area of deep water.

Towns are built wherever there are flourishing mines, as at Scranton, noted for anthracite, Leadville for silver, Kimberley for diamonds, and Johannesburg for gold; and manufacturing towns spring up near coal mines, because coal is very important as a source of steam power for driving machinery.

Good harbors are necessary for the development of large sea trade. Sea-going and lake vessels require sheltered places near the shore, where they may load or unload their cargoes in calm water or ride safely at anchor in severe storms. All the largest cities are ports built at these harbors. Most natural harbors are not adequate, without costly improvements, for

extensive commerce and large ships. The largest vessels require a depth of 25 to 35 feet of water, and many great ports, as Liverpool, Bremen, Hamburg, and Marseilles, were fitted for their use only by deepening and widening the channels at enormous expense; and because Nature tends to destroy harbors by filling them with sediment or rearing sand bars across the entrances, the work of preserving and improving harbors is continually in progress.

The little ditch of the Clyde, turned into a highway for great ships to Glasgow, is a conspicuous example of artificial harbors (Fig. 12). The United States coast line affords many examples of the most important harbor types. Thus many fiord harbors (Fig. 13) are on the coast of Maine. New York and Delaware Bays are examples of drowned

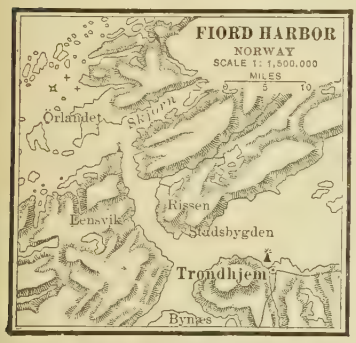


FIG. 13.—The fiords of Norway afford many sheltered harbors for the fishermen. One of the largest leads to Trondhjem, a center for steamer trade.

FIG. 14.—The valley, submerged by sea water, entering through the Golden Gate, gives San Francisco one of the largest harbors in the world.

valley harbors (Fig. 14), narrow and deep arms of the sea often extending far into the land. Long sand banks, heaped up by the waves along the coast from Long Island to Florida, some distance from the mainland, inclose water areas that may be called barrier harbors (Fig. 15), as in Albemarle and Pamlico Sounds, usually too shallow for the larger shipping. Philadelphia, Richmond, and New Orleans

are examples of river harbors (Fig. 16). Many atoll harbors (Fig. 17) are found in the Pacific and Indian

FIG. 15.—Callao, Peru, and Boston, Mass., are examples of ports protected more or less by the barriers that islands present to the sweep of ocean waves.

FIG. 16.—Shanghai means "Near the Sea." The port is an example of a fine river harbor available for large ocean vessels.

Oceans. A few commercial harbors are formed by the breaking down of one side of a crater (Fig. 18), so that the sea may enter the depression.

FIG. 17.—Many coral islands in the Pacific are so arranged as to inclose lagoons, into which ships may enter through passages between the islands.

FIG. 18.—Akaroa and Lyttelton are good crater harbors in New Zealand. Lyttelton is the port of Christchurch, the second largest town in the colony.

CHAPTER V

HUMAN CONTROL OF COMMERCE

The Influence of Races, Governments, and Religions—Impediments to Trade

A common classification of the races is into the black, yellow, and white types (Fig. 19). Commerce is very unequally divided among them. The black type are least civilized, and live mostly in Africa, south of the Sahara desert, but millions of them—the descendants of Africans transported as slaves—live in the Americas and the West Indies. The black races have the smallest part in trade. The yellow type, which include the American Indian and the Eskimo, predominate in Asia and are seen at their best there in the Mongol varieties, of whom the Japanese and Chinese alone are highly civilized and take an important part in trade. The Turks and Magyars of Europe and the Malayan and Polynesian peoples belong to this group.

The white type include the most civilized and progressive peoples, a large part of whom live in the temperate zones where climate, soil, and a great diversity of natural resources tend to produce the highest development. The Indo-Europeans, the largest family in the white group, have spread all over the world and control most of its commerce. They dominate nearly the whole of Europe, the Americas, Australia, Africa, and large parts of Asia and Oceania. The Romanic races of Spain and Portugal have occupied South America, the Germanic (or Teutonic) races of northern Europe have spread over North America and Australia, and the Slavonic Russians have occupied the whole of northern Asia. The Germanic races have been most active in ex-

FIG. 19.— The black type chiefly inhabit tropical Africa, Australia, southern India, and Melanesia. Much of the habitat of the yellow type is the cold, sparsely peopled north lands of Asia, Europe, and America, yielding little except furs and whale oil. The white type include, besides the Indo-Europeans, the Hamites in north and northeast Africa, dark-hued and barbarous peoples, most of whom are opposed to intercourse with foreigners; and the Semites, comprising the Arabs of Arabia, Syria, and north Africa, and the Jews. The latter are widely scattered and very active in commerce.

tending civilization and developing natural resources and commerce; and the governments they maintain are more efficient than any others in protecting life and property and fostering business interests.

Commerce can thrive only under good government. Bad government always kills or cripples industry and trade. Men can not work well unless peace and order prevail, and will not produce much if they are likely to be robbed of their products. Flanders was the great manufactory of Europe till the sixteenth century, when her industries were ruined by Spain's occupation. Under the tyrannical Mahdist government (1885–'96) the area of cultivated land in fertile Dongola, on the upper Nile, was diminished two thirds. The trade in ostrich feathers and gums, sent across the desert from Timbuktu to Morocco and Tripoli, is being diverted to Senegal because the French have made the southern route safe while robbers infest the Sahara.

Good government promotes commerce in many ways. Government departments have special care of trade and industrial interests, as the Department of Agriculture and Department of Commerce and Labor at Washington, the Board of Trade in England, and the Department of Trade and Industry in France. Government funds are used to improve rivers and harbors, dig canals, build lighthouses and life-saving stations, make sailing charts for ocean vessels, and discover and mark hidden rocks that are a danger to navigation. Most of the perils of the sea are near the coasts where the waters are shallow, and all coasts visited by merchant vessels are therefore charted and many thousands of soundings are shown on the maps. Governments also increase and improve production by collecting and distributing information of value to farmers and manufacturers. The sea, lakes, and rivers teem with food, and fisheries boards promote fish culture in various ways. Geological surveys locate mining and quarrying districts, sites for artesian wells, and deal with irrigation problems.

Many citizens of one country have large business interests in other lands. Each nation, therefore, stations its consuls in many other countries to have special care over the rights and interests of their countrymen. In lands that can not guarantee the protection of life and property, as in Morocco and some Oriental regions, law cases in which foreigners are concerned are tried by the consuls under the laws of their own countries. Nations promote trade with one another by commercial treaties, each agreeing to reduce the tariff tax upon imports of the other's products or to maintain a fixed schedule of duties for a series of years, thus obviating the disturbances to trade caused by tariff changes. If the treaty contains a "most favored nation" clause, the two countries agree that each shall share the trade advantages that either may subsequently give to any other country while the treaty is in force.

Tariffs, or taxes upon imports and, in some countries, exports, are maintained by all governments for revenue; and many nations (the chief exception being Great Britain) place a high tariff on some or many products with a view to protecting home industries of the same kind from competition. Usually, only a small tariff, or none at all, is imposed on raw materials imported for manufacture, or on the most needed commodities, if they can not be produced in sufficient quantity at home. The effect of frequent changes in tariff rates is to unsettle business. Merchants and manufacturers are reluctant to buy or produce till they know how an impending tariff change will affect prices. A merchant loses money, for example, if he buys cloth just before a change in the tariff reduces the import duty on cloth and thus cheapens it in the market.

To secure new markets for their products, new sources of raw material, and special privileges for their traders, European powers have acquired many colonial possessions (Fig. 20). The greater part of Africa has thus been divided, in recent years, between Great Britain, France, Ger-

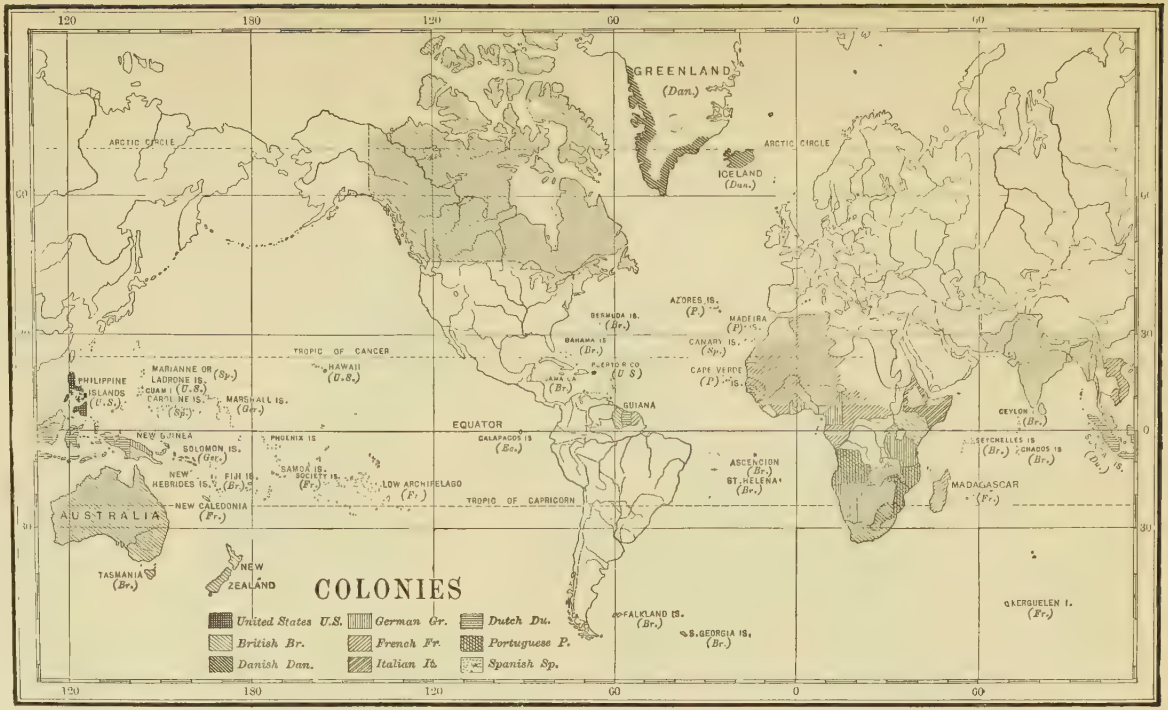


FIG. 20.—Great Britain is by far the largest and richest colonial power. The colonies of Spain and Portugal, once more extensive than any others and including the greater part of America, have been reduced to small dimensions. Holland's large and rich possessions in the Malayan Archipelago make that country a greater colonial power than France, whose most valuable colony is Algeria. Germany did not seek colonies till the best territories had fallen to other nations; her colonies, therefore, are inferior in climates, population, and fertility. **The United States had no colonies till the Hawaiian Islands (now a territory), the Philippines, and Porto Rico were acquired.**

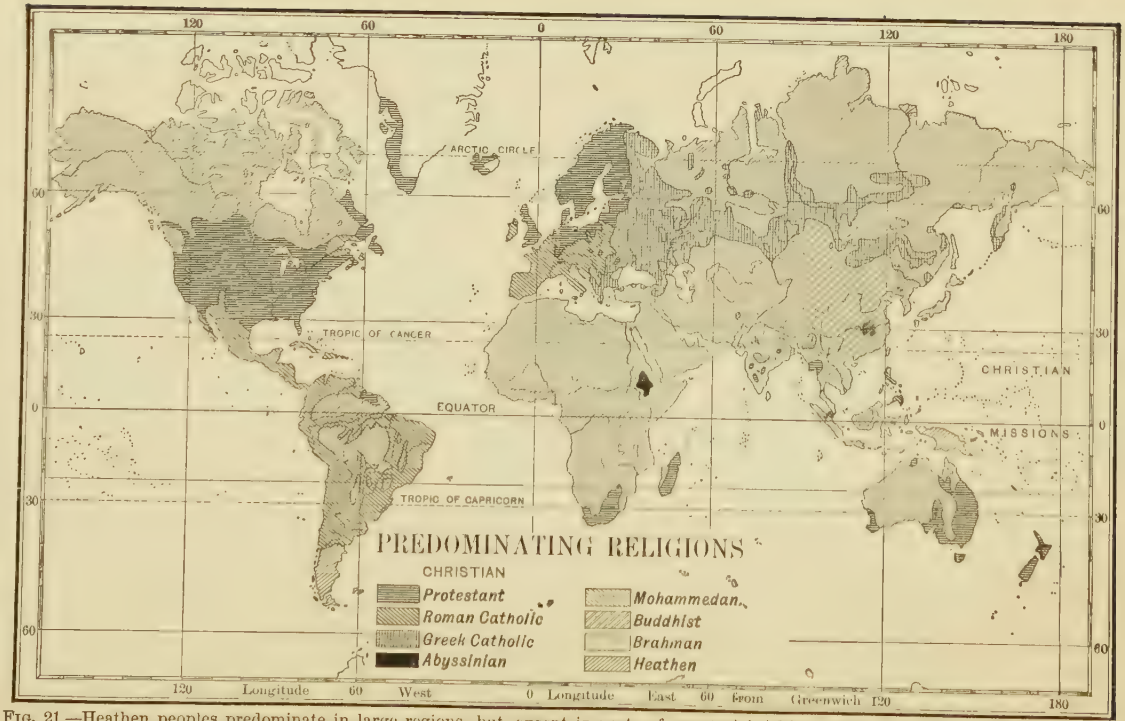


FIG. 21.—Heathen peoples predominate in large regions, but, except in parts of equatorial Africa and the island world, the areas they occupy are sparsely inhabited and are not adapted for high development. The Mohammedans have pushed far southward among the heathen of Africa, many of whom have embraced the religion of their conquerors. The Brahmans predominate in India, and the Buddhists in China. Christian peoples are most advanced in commerce and industries.

many, Portugal, and Italy. Great Britain and Germany have acquired most of the unappropriated islands in the Pacific. Usually, but not always, the mother country has a larger part of the external trade of her colonies than any other nation. Thus the value of imports into Cape Colony from Great Britain are nine times that of the imports from the United States, which stands second on the list. The external trade of Tunis with France is five times as great as with any other country. Besides these powerful influences that government exerts upon trade there are other factors by which business is helped or hindered, and some of them will now be considered.

Predominant religions influence commerce (Fig. 21). Thus the Thirty Years' War, due to religious strife, laid Germany prostrate and destroyed her trade. The Roman and Greek Catholic countries, in proportion to population, consume the largest amount of fresh and salted fish. Canada's exports, for example, to Italy, the West Indies, and Brazil are nearly all fish. Alcoholic liquors are imported into Mohammedan countries only to a small extent, as their use is forbidden. The spread of Mohammedanism in Africa has enlarged the demand for white cottons and increased and improved the production of native cloth, leather, and other manufactures. Buddhist opposition is one of the reasons why foreign trade is largely kept out of Tibet.

Capital and labor are both necessary to industry and commerce. Capital provides the raw materials, machinery, shelter, food, and other supplies which labor utilizes in the production and marketing of commodities. The end sought is attained only by their co-operation, and strife between them destroys the prosperity of both. In the British coal strike (1893) hundreds of factories were closed for lack of fuel to supply power, and thus both capital and labor suffered severely. Both suffer also when they produce more commodities than can be sold. Over-production diminishes or destroys both profits and wages, because prices are sure

to fall. It is essential, therefore, to study the fluctuations of supply and demand. Cotton-growers and manufacturers reaped little benefit from the low price of raw cotton (1894) brought about by vast production. The quantities of goods thrown on the market could not be consumed. Sicily (1895), within three months, shipped to America 800,000 boxes of fruit, glutting the market, and much of it was sold for freight charges and duties.

It is important to bear in mind that nations having an abundance of cheap labor are not always enabled thereby to undersell other nations which may pay even twice as much for labor. This is because the cost of labor is to be measured not by the wages paid but by the value of the product of labor. If a bootmaker receives $2 a day and makes $7 worth of boots, his labor costs less than that of the bootmaker who is paid only $1 a day and makes only $3 worth of boots. The labor on a ton of steel billets and rails in the United States costs less (1901) than in Great Britain, though American wages are higher. The labor cost of a certain grade of shoes in a Massachusetts shoe factory, where wages are high, is only 40 cents a pair, but in Germany, where wages are low, the cost is 58 cents a pair. Such results are due to highly trained labor and the best labor-saving machinery and skill in its use, which greatly reduce the cost of products though the price of labor may be high. Thus the United States, with high-priced labor, is able to sell many of its manufactures in foreign markets in competition with countries in which the price of labor is low.

Various expedients are used to facilitate trade. When commerce grew beyond the stage of barter, which is the direct exchange of one commodity for another, a medium of exchange was necessary, and thus money came into use. Anything that has value may be used as money; thus tobacco in Virginia and codfish in Newfoundland were once used. Cowrie shells are still money in the Sudan. Gold

and silver, from early times, have been the money of civilized and commercial peoples, because they are intrinsically valuable and easily coined. A currency of stable value is of great importance, because when fluctuations in the value of the currency occur it is not easy for farmers, manufacturers, or merchants to foretell whether they will make or lose money.

It is an impediment in the business relations of countries if they use different standards of weights and measures. Iron work for bridges in Norway was ordered, in 1900, from Belgium. The specifications were based on the metric system of measurements. The Norwegians declined to reduce them to British feet and inches, as English manufacturers asked them to do, and sent the work to Antwerp. All nations using a common standard of weights and measures speak the same language as far as weights and measures are concerned. This is the reason why two thirds of the people living under Christian governments now use the metric system devised in France. The people of the United States are authorized by law to transact their business by metric standards if they so desire.

Confusion results if railroad, telegraph, and other business does not conform to a common standard of time. Fifteen degrees of longitude equal a difference of one hour in time. When it is exactly noon where we live it is 1 P. M. 15° east of us and 11 A. M. 15° west of us. Philadelphia time, longitude 75° W., is thus five hours earlier than Greenwich time. All the leading nations except France take Greenwich as the prime meridian or 0° of longitude. The hour zone of time reckoned from Greenwich for every 15°, or one hour difference, east or west of the prime meridian, is employed in the United States (Fig. 75) and in all the countries of Europe, except France, Portugal, and Greece.

The change of date line (Fig. 1) to mark the change of day in circumnavigating the earth, east or west, is placed

in the Pacific, where navigators may most conveniently add a day to or subtract a day from their calendar. It follows the 180th meridian except where it is carried west or east to give certain regions the eastern or western date, so as to serve the convenience of their business relations with the nearest countries or their political interests. In Bering Sea, for example, it is made to pass between the Aleutian chain and the Russian islands, so that the United States territory has the western and the Russian territory the eastern date. The Spaniards carried the western date to the Philippines, and for many years the calendar day there was twenty-four hours behind that of any other part of the Orient. The resulting confusion finally compelled Spain to adopt the eastern date in her colony.

Commerce is most influenced by density or sparsity of population (Fig. 22). The largest commerce can be developed only in well-populated areas, for most sparsely peopled regions can buy little and have little to sell. They may be rich in natural resources, but have neither capital nor labor to develop them. Thus the progress of most Latin-American countries has been slow. Capital is not easily attracted to railroad building where population is too sparse to insure a profit. Commercial routes develop slowly, and the people are too few to form manufacturing centers. The United States, therefore, welcomed a flood of European labor, while Canada, Venezuela, Brazil, Argentina, and many other countries have offered large inducements to immigration. The most densely peopled regions are along the fertile valleys of great rivers like the Yangtse-Kiang, the Hoang-Ho, the Ganges, and the Nile; in the neighborhood of coal and iron mines, supplying fuel for steam power and iron for machine-making, where manufactures are consequently well developed, as in Belgium and Saxony; and along the seacoasts, where temperature and rainfall are more equable, and the cheapest commercial routes, those of the ocean, are at hand (p. 18). In all countries of the Germanic races

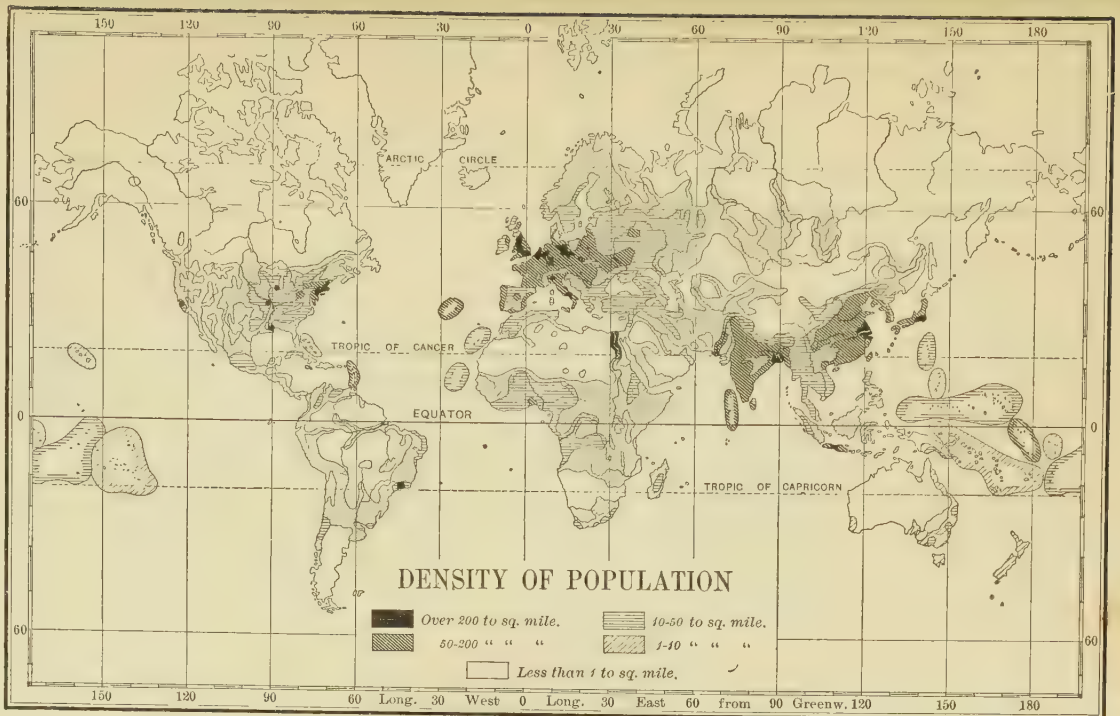


FIG. 22.—Some of the very sparsely peopled areas must always remain so, as the tundra regions of North America and Asia, inhabited by very poor fishing and hunting tribes that, in Asia, also have herds of reindeer; dense tropical forests like the selvas of the Amazon basin; bleak, lofty plateaus like Tibet; and arid or desert regions like the Sahara and inner Australia. China and India are examples of warm countries with rich soil, producing very large crops, and thus supporting enormous populations by agriculture.

the industrial regions are most and the agricultural lands least thickly populated; but this rule does not hold in the densely peopled lands of China and India, which are agricultural countries, whose people, moreover, are so poor that their commerce is not commensurate with their great population.

NOTES AND QUESTIONS

Science is working in many ways to make man's mastery over nature more complete.

What terrible disease afflicted Havana and Santiago, in Cuba, every year until recently?

What has been the effect upon that disease in those cities of keeping the streets clean and enforcing sanitary regulations?

Tropical diseases impede colonization and progress in hot countries. Scores of learned men are now in those countries, studying tropical diseases, their causes and remedies for them.

What insect in West Africa was found to be the cause of malarial fevers?

Men are searching for all the places in hot countries where enfeebled persons may regain health and strength. They have found many of them in Africa and the African islands, in India and other countries. Tropical mountains are used as sanitariums. Many resort to these places for recuperation and to counteract the evil effects of numerous diseases.

CHAPTER VI

TRANSPORTATION

The Use of Wind, Steam, Animals, Conduits, and Electricity in Carrying Commodities

More freight is carried between different countries by water than by land (Fig. 23). Nearly three fourths of the earth's surface is ocean, and most commodities carried from one country to another go by the sea route. In some countries, also, as in Russia and China, more material is moved by water than by land from one part to another of the same country. Many rivers, lakes, and inland canals, however, lose much importance as trade routes after large railroad systems are built; but even then they have much influence in reducing freight rates when they run parallel with railroads and thus compete with them. They are still extensively utilized for freight carriage in continental Europe and in the United States, though railroad freights are very cheap, the inland water ways are used to a large extent in transporting grain, coal, iron ore, lumber, cotton, and other bulky articles; and the coastal traffic from port to port is very large. China utilizes interior water ways more than any other nation, for they are almost her only interior trade routes, except very poor cart roads. In all undeveloped regions like the Congo basin, rivers are especially utilized for trade. Great improvements in transportation have been brought about, mainly by the introduction of steam in the middle of the nineteenth century.

Economy of time is of great moment in transportation. Steam has therefore superseded wind power on the ocean

Ocean sailing vessels merely skirted the coasts till 1500, and then for three centuries they commanded every sea till the rapid development of steamships, after 1840, deprived sailing craft of many opportunities, though they still carry much freight whose speedy delivery is not important. Steamship routes are usually shorter than those of sailing

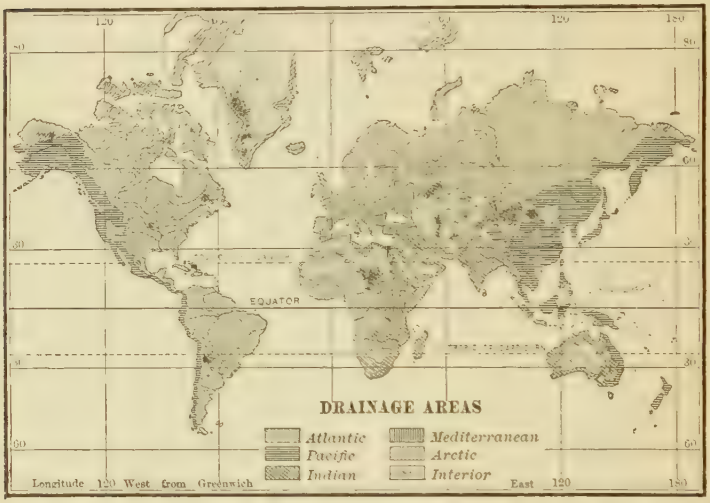


FIG. 23.—The average number of steam and sailing vessels constantly afloat on the Atlantic is over 5,000. It is the greatest sea highway because the most important commercial areas (Fig. 1) are tributary to it. Its value for sea trade is increased by the fact that nearly all the navigable rivers of America and Europe flow to it. Observe the wide area in America that is drained to the Atlantic. Contrast it with the narrow belt that is drained to the Pacific. The short rivers of the Pacific slope are comparatively of little value to commerce. The rivers of the Arctic drainage area are of small commercial importance, because they are frozen most of the year and empty into an ice-choked sea.

vessels, as their course is more direct in the face of adverse winds (p. 19). Steamships travel about four times as fast, and thus steam has brought the nations much nearer together. Columbus, in 1492, was seventy days crossing the Atlantic from Spain to the Bahamas. Benjamin Franklin, in 1775, was forty-two days from America to Europe. The

steamship Savannah, in 1819, crossed the Atlantic from Savannah to Liverpool in twenty-two days. The North Atlantic passage was reduced in 1850 to thirteen days; in 1860 to eleven days; in 1870 to nine days; in 1880 to eight days. Then came the "ocean greyhounds," which have reduced the record between Sandy Hook and Queenstown to less than five and a half days. Goods are often placed upon the shelves of Chicago stores within ten days after they leave France. Slow transportation sometimes results in actual calamity, as in China, where people may be starving in one province before rice can reach them from another. The common roads of England were so poor in early days that there was often scarcity of grain in one part and plenty in another part of the country.

Larger ships and better machinery have reduced freight rates. Though the speed limit of ocean vessels has apparently been reached in present conditions, the substitution of iron and steel for wood in shipbuilding has made it possible to build much larger ships, thereby increasing carrying capacity and reducing the cost of freight per ton. In 1897 the Pennsylvania, capacity 14,000 tons,* was built. In 1899 the Oceanic, 25,000 tons, was launched, and in 1900 the Deutschland, 23,000 tons. Improvements in machinery have reduced the cost of driving vessels and thus have diminished freight rates. Better furnaces, boilers, and engines reduced the cost of steam power between 1870 and 1897 about 40 per cent. One pound of coal now supplies nearly three times as much steam power as in 1875. Steamship companies therefore can afford to carry freight at much cheaper rates than formerly. A bushel of wheat is

* The word ton, as applied to vessels, is a measure of capacity, meaning 100 cubic feet occupied by passengers or freight. When gross tons are specified the entire cubic contents of the vessels are meant. A steamship has nearly four times the carrying power of a sailing vessel of the same tonnage, because it can make the voyage in one fourth of the time.

delivered at Liverpool from the North Dakota wheat fields at a little over 20 cents. Thus cheap freights from America make it impossible for British and German growers, on their high-priced lands, to compete with American cereals. Cheap freights also make it possible to send heavy and bulky goods of low value to far distant lands. Holland imports her building stone; and lumber is profitably imported into Cape Colony and China from Oregon and Washington. Refrigeration makes it possible to transport meats and other perishable commodities thousands of miles and deliver them in good condition. Thus onions are delivered in prime condition from Spain to the United States, and tomatoes from Spain to Great Britain. Fresh grapes are sent in cold storage to the midwinter markets of Great Britain from Cape Colony and Australia. Shipments of refrigerated meats began in 1881, and now millions of frozen, dressed beeves and sheep are sent every year from Australia, New Zealand, Argentina, and Uruguay to the United Kingdom and other markets.

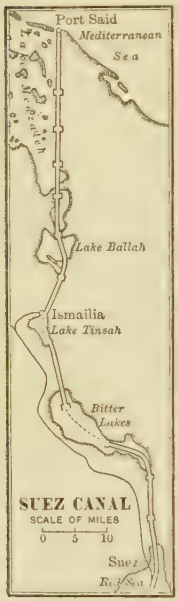


FIG. 24.—The Suez Canal, 101 miles long, as compared with the Cape of Good Hope route, shortened the distance from Southampton to Bombay by 4,800 nautical miles. The canal stimulated the trade of all Mediterranean ports, and diverted shipping from Cape Town, formerly a coaling station on the sea route to India.

Ship canals are built to shorten sea routes (Figs. 24–28). They are maintained by tolls on the shipping that utilizes them. They cheapen freights and reduce the time required for delivery of goods. They profoundly affect not only trade but also other occupations of men. Before the Suez Canal (Fig. 24) was built, sailing vessels carried most of the freight between northwest Europe and the Far East, as the cost of coaling steamships for India or China

via the Cape of Good Hope was very great. Wheat could not be carried on slow-sailing vessels through the hot Indian Ocean without deterioration; but when the canal was built India became a great wheat-exporting and consequently a larger wheat-growing country. Some ship canals are extended inland to make a seaport of an interior city. Thus the Manchester Ship Canal, 35½ miles long, makes that inland city a seaport and saves the transshipment by rail from Liverpool of raw cotton and other commodities. Merchants who must transship goods *en route* are at a disadvantage compared with those who have direct transportation to many ports as extra handling, loss of time, and therefore greater expense, are involved in transshipment.

Fig. 25.—The Kaiser Wilhelm Canal, between the mouth of the Elbe and Kiel Bay, 61 miles long, admits the largest vessels and saves two days' time by steamers between Hamburg and all the Baltic ports of Germany, as compared with the old route *via* the strait between Jutland and Sweden.

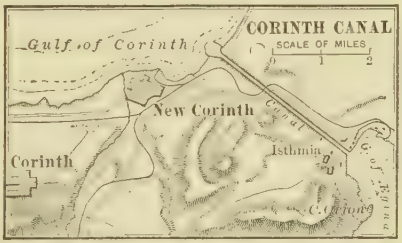


Fig. 26.—The Isthmus of Corinth Canal, 3.7 miles long, connects the Ionian and Ægean Seas, and gives a much smoother and shorter passage from Italy to Odessa than that around the south end of Greece.

Fig. 27.—The North Holland ship canal, 16 miles long, was built by the Dutch Government to afford shorter transit between the North Sea and Amsterdam available for large vessels.

The Panama Canal, to be completed by 1915, will shorten the sea distance from all North Atlantic ports to the Pacific ports of America one half or more.*

FIG. 28.

The most important railroads connect the interior with the oceans (Fig. 1). Their extensions and branch lines enable them to provide a great many interior points with rapid transit to the ocean highways. The transcontinental lines in the United States and Canada are thus a part (1911) of the shortest and quickest routes to Japan, East China, and New Zealand for all North Atlantic ports of America and Europe. When the Siberian railroad was completed to Vladivostok, travelers were able to reach Japan and China in less than twenty days from London.

The United States has a far larger mileage of railroads than any other country (Fig. 74). Nearly all the villages and farms of the United States east of Omaha, Kansas City, and Houston have a railroad station close at hand or only a few miles distant, so that all parts of the more thickly settled regions have quick communication with one another and with the seaports. Freight trains on these roads run faster and freight rates are lower than in any other country. Thus abundant, rapid, and cheap transportation has helped to make the United States the leading commercial nation. Is it any wonder that there is far

* This American canal will bring the Atlantic coast of North America nearer to Australia and Japan than any north European city is, and will place New York, Boston, and Philadelphia on even terms with Liverpool, London, and Hamburg in relation to sea distance from all the coast of China between Hongkong and Tientsin. West of Hongkong the Suez Canal will be shorter to the Orient for both European and American ports of the North Atlantic.

smaller commercial development in Spain, for example, where trains run only 15 to 20 miles an hour, and freight rates are so high that it costs more to carry goods by rail from Saragossa to Barcelona, 200 miles, than by ship from England?

Water transportation is cheaper than land transportation. The reason for this is that the same power can move a greater tonnage through water than over the land. The cheapest freight rates are on some of the long ocean routes. The cost of moving freight on the great lakes of North America is slightly higher than on the ocean, because lake vessels are smaller and navigation is restricted at the connecting rivers and canals. The cost on the Erie and other canals is higher than on the Great Lakes, because canal navigation is restricted by small boats, shallow water ways, and locks. The average cost on the railroads of the United States is about twice as much as on its rivers and canals. The cost on wagon roads is much higher, varying from six to ten cents a mile for hauling a ton of freight over the best roads to twenty-five cents or more over very poor roads. The cost of haulage by wagon on the common roads of Europe is much less than in this country because of the superiority of the European roads. In Holland, Russia, and India there is little or no rock suitable for road metal, and many of the Dutch roads are paved with brick.

Animal power is the most expensive means of transport (Fig. 29). It is still used where there is little or no water or rail transportation. Two classes of draft and pack-animals may be distinguished: (1) those which, like the reindeer, yak, llama, and elephant, are restricted to certain regions and (2) those which may range over nearly the whole world, as the dog, horse, donkey, and ox. In equatorial Africa, where there are few pack or draft animals, native porters carry loads of 60 to 80 pounds on their backs. The wages of Congo porters is only $10 a month, and yet before the railroad was built it cost over $200 a ton to move

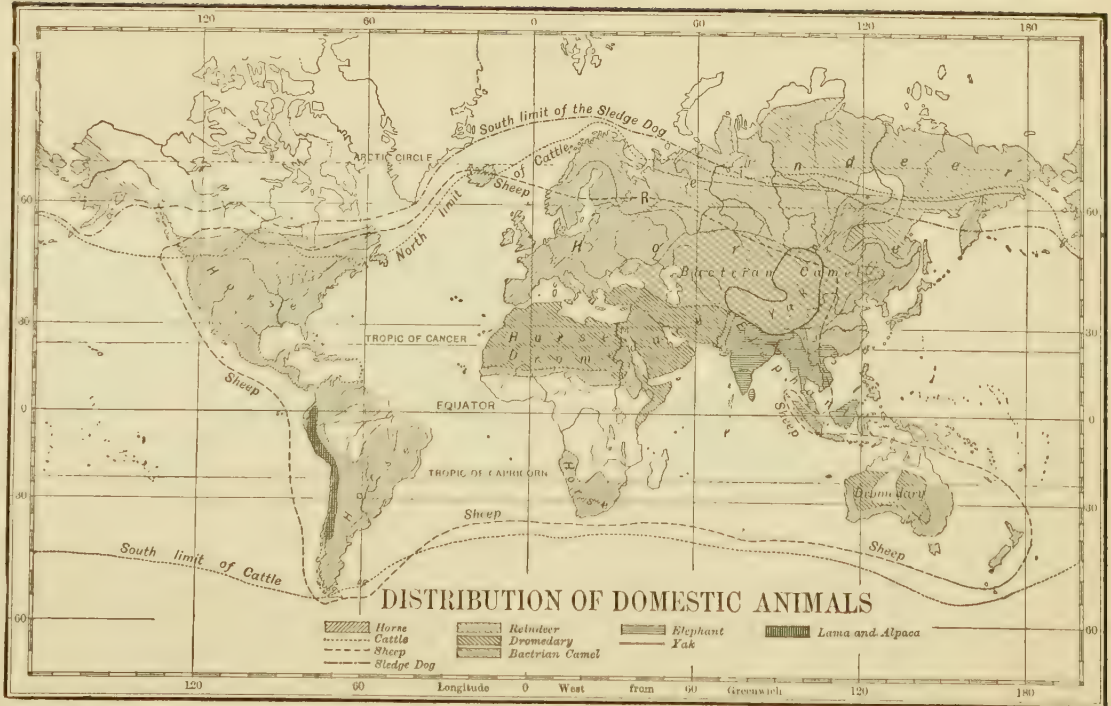


FIG. 29.—The domesticated reindeer is the means of transport of the hunting and fishing folk of northern Europe and Asia. Farther north the dog is a sledge animal; in Belgium and some parts of Europe he hauls carts to market. The yak is a pack and saddle animal. The Asian elephant is a transport animal, chiefly in the timber trade and Government service. The dromedary (one-hump camel) carries a load of 500 to 700 pounds, while the stronger Bactrian camel (two humps) carries 1,000 to 1,500 pounds. The sure-footed llama seldom makes a misstep on the narrow paths of the Andes, where he is used chiefly to carry gold and silver from the mines to the coast. The horse is found everywhere in temperate and subtropical regions, but has only limited distribution in tropical lands. The donkey is most of all identified with small truck farming in western Asia and all Mediterranean countries. He is valued in America chiefly among breeders of the mule, a hardy, strong animal found in most parts of the world, and especially in America and the Mediterranean countries. The ox is used in most lands as a beast of burden or draft, but for long-distance hauling he is

freight around the 235 miles of cataracts in the lower Congo.

Fluid commodities gave rise to conduits as a means of transport. The first important use of conduits was in Greece and Italy, the Romans building fine aqueducts to carry water to the towns. In quite recent times the use of conduits has become very extensive, and such commodities as petroleum, illuminating gas, and water are conveyed long distances in iron pipes. Crude petroleum is forced by pumps through pipe lines for hundreds of miles from our oil fields to the refineries; and the Russians (1901) are preparing to pump petroleum over the mountains for 600 miles from Baku on the Caspian to Batum on the Black Sea.

Electricity is used to transmit power and intelligence (Fig. 6). The energy of steam, water, wind, or other power used in generating electricity may thus be made effective many miles away. The electric motor has become a large agent in transportation, particularly in street-car service, and intelligence is flashed all over the world by electricity. The movements of vessels and trains are directed by wire. With the aid of 200,000 miles of ocean cable lines the business men of widely separated countries conduct their mutual affairs as though they lived in the same town. Long-distance telephone messages are sent from Maine to Wisconsin and from France to Holland. Thus electricity has become a far-reaching medium of communications upon which the transactions of finance and commerce largely depend. The postal service is a cheaper and slower means of communication. It is so important that the United States, for example, annually expends about $10,000,000 more than its postal receipts to provide its vast area with adequate service. Most countries are members of the Postal Union, and postage charges are uniform from any country of the Union to any other, except that in some cases, as between the United States and Canada, the rates are lower than the international rates. The value

to commerce of the postal and telegraph services is inestimable.

The World's Merchant Marine

[Compiled from Lloyd's Register]

Steam Tonnage (100 Tons Gross and Upwards) and Number of Vessels of the Principal Maritime Countries

Flag.	1900.		1910.	
	No.	Gross Tons.	No.	Gross Tons.
American:				
Sea	690	878,564	1,073	1,641,919
Lakes	242	576,402	563	2,146,769
Austro-Hungarian	214	387,471	365	777,729
British	7,930	12,149,090	9,837	18,059,037
Danish	369	412,273	553	671,828
Dutch	289	467,209	532	983,049
French	662	1,052,193	875	1,448,172
German	1,209	2,159,919	1,822	3,959,318
Italian	312	540,349	450	987,559
Japanese	484	488,187	846	1,146,977
Norwegian	806	764,683	1,312	1,422,006
Spanish	422	642,231	511	746,748
Swedish	678	418,550	964	782,508
Other Countries	1,591	1,432,237	2,305	2,516,076
Total	15,898	22,369,358	22,008	37,289,695

The sail tonnage of the world has decreased from 21,190 vessels of 9,166,279 net tons in 1890 to 8,050 vessels of 4,624,070 net tons in 1910.

CHAPTER VII

THE UNITED STATES

CLIMATE—NATURAL FEATURES—DISTRIBUTION OF LEADING PRODUCTS

The United States is able to produce at home nearly all the necessities and luxuries of life. This is because its territory, extending north and south over 1,500 miles and varying in altitude from sea level to more than 10,000 feet above the sea, permits the cultivation of nearly all the food and industrial plants of the temperate and subtropical zones. Its mineral resources also are large, and the inhabitants are able to produce most of the commodities they desire. Only countries that embrace half a continent and great variety of climate like the United States, or all of a continent like the Australian Commonwealth, may thus become nearly self-sustaining.

The continental climate prevails even to the Atlantic Ocean (p. 7). The country east of the Pacific slope is therefore colder in winter and warmer in summer than western and central Europe. If there were high mountain ranges stretching east and west across the continent they might ward off the icy northern and hot summer blasts that blow over nearly the whole country, but they would also arrest the moist winds from the Gulf of Mexico that now scatter their wealth of water over the whole length of the Mississippi Valley, making it one of the most productive regions of the earth. The prevailing climate in the extreme South is subtropical, while along the Northern frontier and in the high plateau region of the West the mean annual tempera-

ture is 20° to 30° lower; so that the hardy cereals are the characteristic products of the most Northern, and cotton, rice, sugar cane, and oranges of the most Southern States.

The eastern half of the country has abundant rainfall. As the precipitation is well distributed through the year the growing season has an adequate supply (Fig. 30).

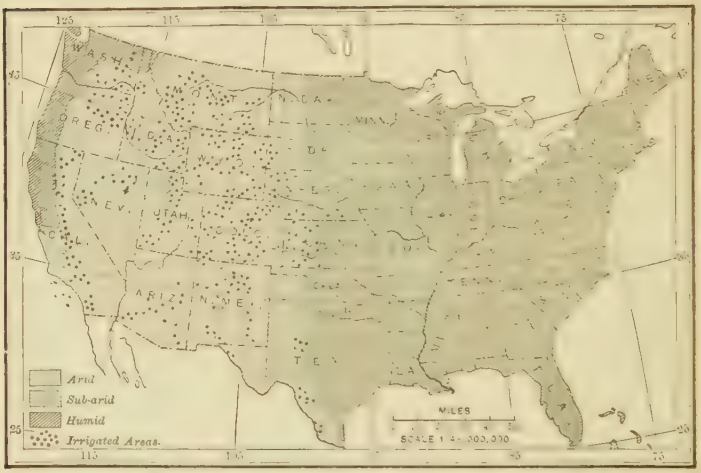


FIG. 30.—RAINFALL IN THE UNITED STATES.

Good crops may be grown with 18 to 20 inches of rain, and this amount is doubled in two thirds of the humid region. The subarid zone is a belt of prairie nearly 200 miles wide, where good crops grow without irrigation only one or two years in five. It merges into the wide arid region, whose aridity is due to the arrest by the western mountains of vapor-laden winds, preventing them from passing eastward. Compare this map with Fig. 31 as an illustration of the influence in the United States of humidity and aridity upon density of population.

Thus the country east of a line passing north and south through the central parts of the states from North Dakota to Texas, together with a long narrow strip of the Pacific coast, comprises the area of farm lands. Here and there throughout the subarid and arid regions water is secured from rivers or wells to give fertility to adjoining lands by irrigation, which is the diversion of water to fields and gar-

dens for agricultural purposes. The cost of irrigation in California is $10 to $20 an acre, which is more than balanced by increased productiveness.

The largest number of deep-water harbors are along the North Atlantic coast. They face the Old World and are nearest to the leading commercial nations (Fig. 1). These inlets, from Maine to Virginia, and particularly Massachusetts, New York, Delaware, and Chesapeake Bays, being the best harbors and the nearest to foreign markets, command

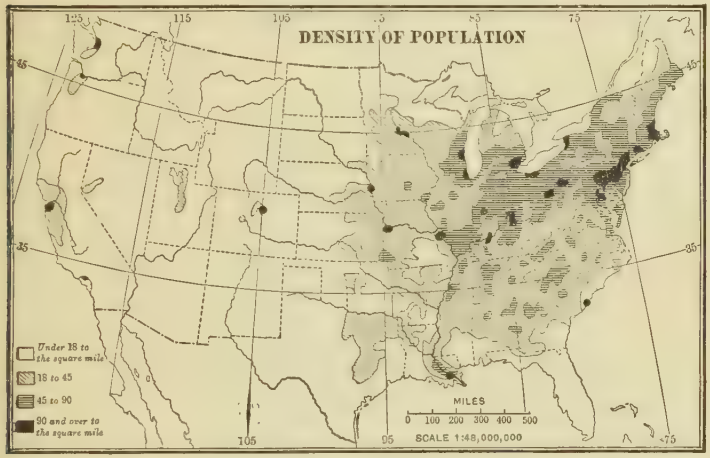
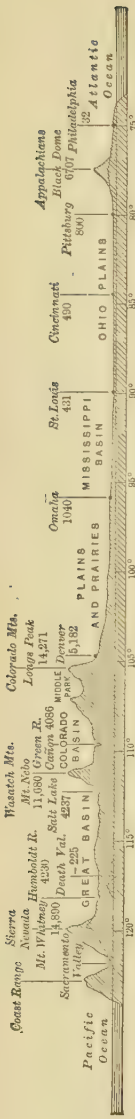


FIG. 31.—The density of population in the United States is far less than in any country of Europe except Norway and Sweden. With its small density of population and its very large territory it could not have attained the present development of its commerce if its vast system of communications, chiefly by rail, had not afforded the lowest land freight rates in the world.

the largest part of the export and import trade. The Atlantic coast south of Chesapeake Bay and the Gulf of Mexico have smaller harbors of much importance in the distribution of southern and Mississippi Valley products; but the steep Pacific coast has no harbors of importance except those of San Francisco Bay, Puget Sound, San Diego, and the river port of Portland, Ore.

120
110
100
90
80
70
50
40
30
THE GREAT BASIN
THE GREAT PLAINS
THE GREAT VALLEY
Over 10,000 ft.
5,000 to 10,000 ft.
2,000 to 5,000 ft.
500 to 2,000 ft.
AFTER HENRY GANNETT
OROGRAPHICAL
MAP OF THE
UNITED STATES
MILES
0 100 200 300 400 500
SCALE, 1:32,500,000
Longitude West from Greenwich

FIG. 32.



SECTION ACROSS THE UNITED STATES
HEIGHTS IN FEET

FIG. 33.

The predominant surface forms are a wide, low, central plain shut in on the east by low mountain ranges, and on the west by high plateaus and mountain ranges. These surface forms and their general effect upon industry and commerce may best be studied in connection with Figs. 32 and 33. Contrast the low-lying Atlantic and southern coastal plains (white, in Fig. 32) with the high, steep, and rocky Pacific coast. Compare Fig. 32 with Fig. 72, and note the many short reaches of river navigation on the Atlantic and Gulf seaboard made possible by the gently sloping coastal plains and the contrast in this respect which the Pacific coast offers. Nearly all the navigable rivers and lakes are in the eastern half of the country tributary to the Atlantic, the highway to the largest foreign markets. This fact is of great advantage to the producers of breadstuffs and meats. These rivers and lakes supply three water routes to the Atlantic: (1) the Mississippi system to the Gulf of Mexico; (2) the Great Lakes, supplemented by the Erie Canal to the Hudson River; and (3) through the St. Lawrence in Canada. The Mississippi basin affords over half of the navigable mileage of the country. In the western half of the country, the railroad is the commerce carrier, except that the Pacific slope has about 1,400 miles of river navigation.

The Atlantic coastal plain has a large variety of industries. This is due in part to the diversity of the soils, which are arranged in narrow belts extending north and south. A clay belt near the inner edge of the plain gives rise to the potteries of New Jersey; farther east is a hilly belt with limestone soil devoted to cereals and hay; still nearer the ocean is a sandy plain, either barren or covered with pine forests, which in the Carolinas, Georgia, and Florida yield large supplies of lumber and turpentine; and along the sea edge are swamps, particularly south of Chesapeake Bay, very fertile when drained, and producing much rice in the Carolinas and farther south. Large quantities of fruit and vegetables are raised for Northern markets, and the most important fisheries are those of the Atlantic coast. Water power along the inner edge of the Atlantic coastal plain developed manufacturing. The rivers crossing from the hard rocks of the Appalachian belt to the soft rocks of the coastal plain have more rapidly worn away the soft rocks, thus forming falls and rapids. This line of falls is called the "fall line." Manufacturing towns from Trenton, N. J., to Montgomery, Ala., which use the water power are shown in Fig. 72, at the head of navigation on the coast rivers.

The Appalachian belt contributes the larger part of the country's coal, petroleum, and natural gas, and much of its iron. It consists of mountains and border plateaus, and extends behind the coastal plain from Maine to Alabama. This belt, a source of great water power, made New England the first and largest center of factories. Manufactures and commerce therefore have thus far been most highly concentered in the East, where there are fine natural harbors, rich deposits of coal and iron near them, many rivers of large or considerable value to commerce, abundant water power, and comparative proximity to Europe.

The southern coastal plain is mainly agricultural. It is almost wholly included in the cotton belt, but has impor-

tant sugar production, chiefly in Louisiana, and all the Gulf States produce large quantities of lumber. It merges in the Great Valley.

The Great Valley is pre-eminently the agricultural region. The northern part is the greatest wheat and maize-producing area in the world, the southern part the greatest cotton-growing area, while in the border lands between them (mainly Kentucky) is the largest of the tobacco areas. There is extensive hog and cattle raising in the corn belt from Nebraska to Ohio, where the chief centers of the animal industries (meat packing, etc.) are situated.

The Great Plains are the largest field of the grazing industry. They extend from Canada to Mexico (Fig. 32). The rainfall in large sections is insufficient for tillage without irrigation, but millions of cattle and sheep feed on nutritious bunch and other grasses over nearly three fourths of the plains; but the grazing industry has fallen off rapidly since 1905, owing to overcropping and to dry farming introduced in some parts of the plains.

The Great Plateaus are the largest sources of gold and silver. They are surmounted by the Rocky Mountains, extend from the Great Plains to the Sierra Nevada range, and include the Great Basin, whose few rivers have no outlet to the sea. These arid plateaus embrace about one third of the country. The mines among the mountains supply a third of the world's output of silver and a fourth of the output of gold. Agriculture is possible only by means of irrigation, except along a few river valleys in the north.

The Pacific coast has gold, wheat, lumber, and fruit as its leading products. The northern two thirds is well watered (Fig. 30), and irrigation has reclaimed large tracts farther south. The rich wheat-growing regions of the Sacramento and San Joaquin valleys in California, and of the Willamette and other valleys in Oregon and Washington, are the granaries of the Pacific slope. The mountains of the north, clad with pine, spruce, and firs, are one of the country's

chief sources of lumber supply. Thus wheat and lumber are very large shipments from Pacific coast ports. The vine and subtropical fruits are also grown with success.

The basin of the St. Lawrence River is the largest source of iron and of inland fisheries. Most of the white pine lumber, once the largest wood crop of the country, comes from the upper lake region; the south and west shores of Lake Superior produce the largest iron ore output of the country; in the Keweenaw Peninsula on the south shore, are some of the largest copper mines of the world. In the southern part of this basin are scores of manufacturing towns whose prosperity is partly due to their convenient situation between supplies of iron ore on the north and coal on the south. The Great Lakes are the highway on which many of the most bulky commodities of the country are transported in large steamers at low freight rates, such as the wheat of the Dakotas, the iron ore and lumber of Minnesota, Michigan, and Wisconsin, and coal from the Illinois, Indiana, Ohio, and Pennsylvania fields.

Manufacturing is carried on in most parts of the United States. While these industries are chiefly in the northeast and north central parts of the country, they are found wherever conditions are favorable for collecting raw materials and marketing products. Thus, in the Southern states sugar is refined at New Orleans, near which are the largest cane plantations. Lumber and furniture are made at Macon, Montgomery, and Mobile, near the large forests of the Gulf states. The manufacturing areas are practically identical with the regions covered by the two darker shades in Fig. 31. The development of the vast resources whose distribution is here briefly outlined has made the United States, in a little over a century, a nation of seventy-six million people, the largest agricultural and manufacturing and the most nearly self-sustaining nation in the world.

CHAPTER VIII

THE UNITED STATES—(*Continued*)

Vegetable Food Products, Beverages, Tobacco, and the Trade in Them

The United States holds the first place as an agricultural nation. Its farms, 5,739,657 in 1900, make the largest contribution to the world's supply of breadstuffs, meat products, and raw cotton. Most of the land available for tillage in the humid area is now owned by farmers. The remainder is uncultivated or in timber. Value of farms in 1906 in billions of dollars, 23; farm products, 6.8.

All vegetable farm products were derived from wild plants. They have been greatly improved in size and nutritive quality by cultivation. Some of them, as maize, the potato, tobacco, and the tomato and pumpkin, were not known in Europe till introduced there from America. The cereals are a few grasses whose seeds, improved and enlarged by tillage, are used as breadstuffs. They are the vegetable food of most importance, and hence are the largest product of the world's farming lands (Fig. 34).

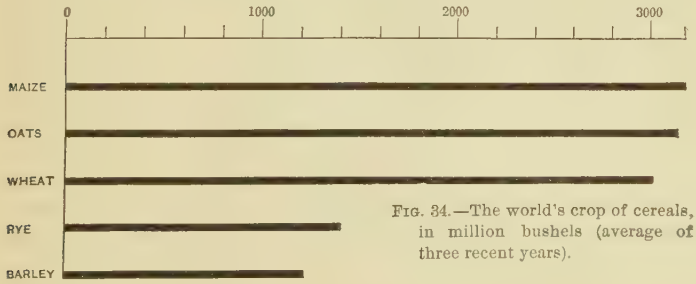


Fig. 34.—The world's crop of cereals, in million bushels (average of three recent years).

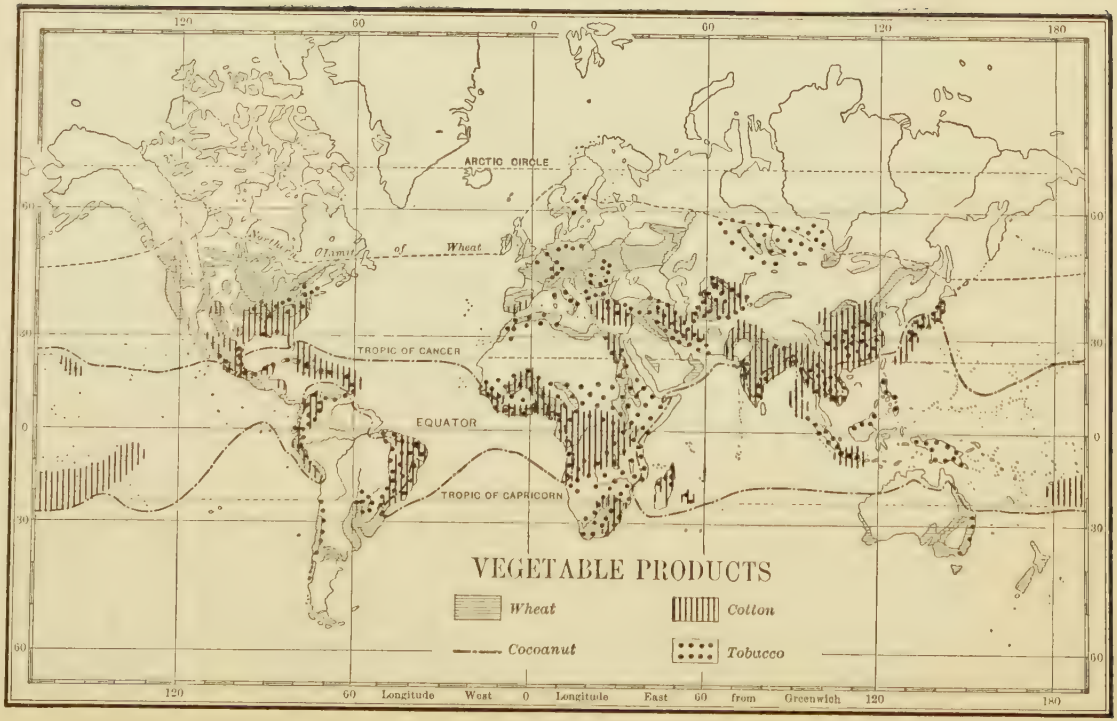

120
60
0
60
120
180
ARCTIC CIRCLE
Northern Limit of Wheat
TROPIC OF CANCER
EQUATOR
TROPIC OF CAPRICORN
VEGETABLE PRODUCTS
Wheat
Cotton
Cocoanut
Tobacco
Longitude West
Longitude East
from Greenwich

FIG. 35.

Wheat is the most widely distributed, most costly and nutritious of the cereals (Figs. 35 and 36). It is the chief breadstuff of western Europe and the temperate parts of America. It thrives in temperate climates, and is also a winter crop in warm countries like northern India, where the winter is at least as cool as a Minnesota summer.

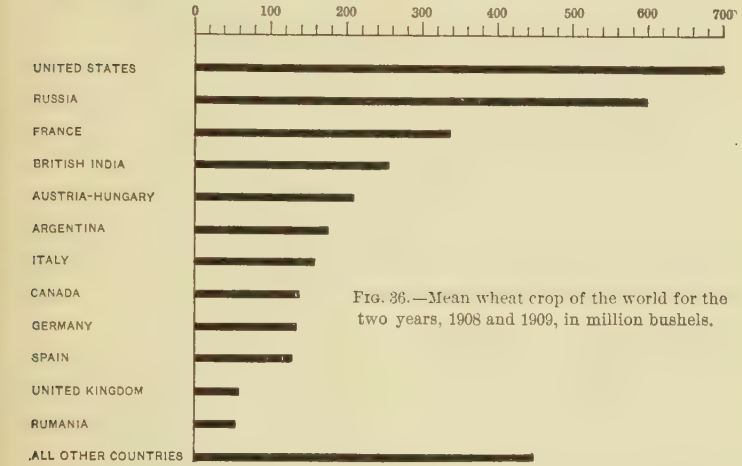


FIG. 36.—Mean wheat crop of the world for the two years, 1908 and 1909, in million bushels.

The United States is the largest wheat producer (Figs. 36 and 37). This is due not only to suitable climate and soil, but also to cheap land, the best agricultural machinery, and the most economical methods of handling and transportation. Wheat is sent to market in bulk (in a loose condition). From the time it leaves the farm wagon it is handled almost wholly by mechanical means. The labor is greatly reduced by grain storehouses, called elevators, into which the grain is raised and emptied into bins and later transferred to the conveyance in which it is forwarded, all the work being done by machinery. As each owner's grain can not be kept separate from the rest, it is inspected and graded, each quality going into bins assigned for its grade, and a receipt being given to the owner showing the quantity

and quality of his grain. Only the larger grain centers of Europe employ this economical American system.

The domestic distribution of wheat and flour is very large. Minnesota and the Dakotas, which comprise the greatest wheat region, Kansas, Nebraska, Washington, and Oregon

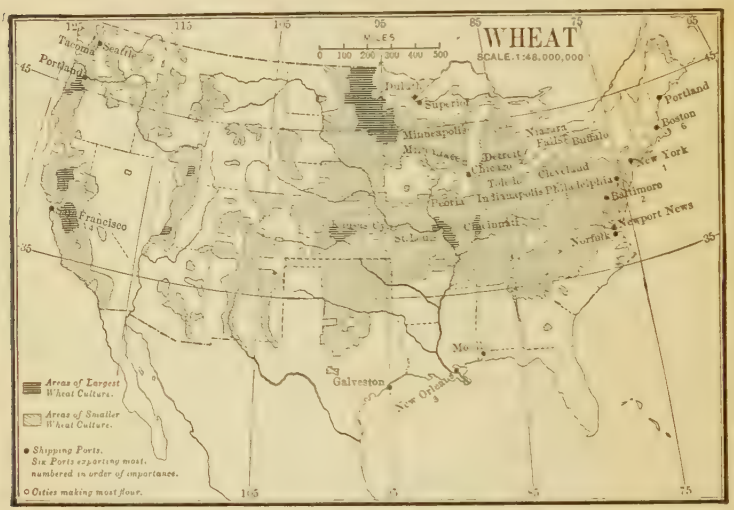


FIG. 37.—Observe the chief wheat-shipping ports and the cities producing most flour. While wheat is grown in many States, the areas of largest production are comparatively small. Eastern farm lands can not now compete in wheat raising with the low-priced prairies of the Northwest. The plump kernel winter wheat is grown in the Central and Southern States. Hard spring wheat of the upper Mississippi Valley, the wheat of export, is the best for many purposes; its price regulates the world's wheat markets.

sell the larger part of their product to buyers outside their own territory. All the northeastern, southern, and Rocky Mountain states must buy wheat to make up their deficiency.

The United States was the largest seller of export wheat until 1908, when Argentina surpassed this country in foreign sales. Argentina has long raised far more wheat than her comparatively small population can consume. About a fourth of our total crop is sold to foreign

HARVESTING WHEAT IN THE UNITED STATES.

THRESHING WHEAT IN RUSSIA.

countries. Russia, Austria-Hungary, and the Balkan states are the only European countries raising all the breadstuffs they require. All the others buy wheat from the United States, Russia, India, Hungary, Argentina, or Australia. Russian and Argentine wheat have only a short haul to shipping ports, while our wheat must be carried an average distance of 1,000 miles to ocean steamers. This disadvantage is overcome by low rates of rail and water freightage to United States seaports.

One half, sometimes much more, of our wheat exports is in the form of flour. Flour manufacture was revolutionized by the new milling process adopted in the hard wheat region about 1874. Chilled iron and porcelain rollers took the place of the old millstones, the grain being run through six or seven sets of rollers. A large part of the wheat of Minnesota and the Dakotas is ground into flour at Minneapolis and Superior, and thence distributed East, South, and to Europe (Fig. 37); Minneapolis, on the threshold of the hard wheat region, is the largest milling center in the world. Great Britain buys about four sevenths of all the flour the United States sells; other European countries buy more wheat than flour and do most of their own milling. All tropical and Oriental countries buy much more flour than wheat, for they lack the flour-making facilities that the large wheat-raising countries have perfected.

Maize or Indian corn is the best grain for fattening animals (Fig. 38). It contains a larger proportion of fats than other cereals. Europeans eat little of it, but feed it to their stock. Americans, however, use it extensively as food both for man and beast. It is also widely used in the manufacture of distilled liquors, starch, and glucose.

Maize is the largest cereal crop of the United States. This country produces three fourths of the world's supply (Fig. 39). The greatest maize-growing states are Nebraska, Iowa, Kansas, Missouri, Illinois, Indiana, and Ohio, which are known as the Corn Belt. Most of the enormous crop

120
60
0
60
120
180
ARCTIC CIRCLE
RUSSIA
North Limit of Maize
FRANCE
SWITZERLAND
UNITED STATES
CHINA
JAPAN
TROPIC OF CANCER
WEST INDIES
EGYPT
INDIA
PHILIPPINE IS.
EQUATOR
BRAZIL
TROPIC OF CAPRICORN
AUSTRALIA
CAPE COLONY
VEGETABLE PRODUCTS
Sugar Cane
Sugar Beet
Maize
Pepper
L.L. POATES, ENGR., N.Y.
120 Longitude West 60 from Greenwich 0 Longitude East 60 120 180

FIG. 38.

in the corn belt is fed to hogs and cattle and thus converted into pork and beef; the live stock return to the land as manure much of the valuable salts extracted from it; and the animal waste products, converted into fertilizers, also help to maintain fertility. Maize is exported mainly in the condensed form of meat. The exportation

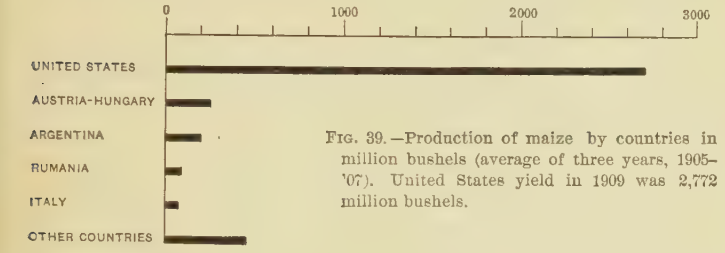


FIG. 39.—Production of maize by countries in million bushels (average of three years, 1905–'07). United States yield in 1909 was 2,772 million bushels.

of the grain is large only to northwest Europe and Canada, and the value of the total export is only one third that of wheat and wheat flour. The reasons for this comparatively small export of the grain are (1) its low price in proportion to weight, making its transportation more expensive than that of wheat; and (2) its limitation to animal feeding in the importing countries of Europe.

Oats is used chiefly as horse feed. Its importance as human food is increasing with the larger consumption of prepared cereal foods. It is grown most largely in the corn belt of the United States and in the moist sea climate of Ireland, Scotland, and western Norway, and near the Baltic coasts of Germany and Russia (Fig. 40). Half of the small export from the United States is sent to Great Britain.

Rye is an important food grain in Russia, Germany, and Scandinavia. It is cheaper than wheat and not so nutritious. It is largely used in distilling whisky in the United States, gin in Holland, and vodka in Russia. Russia is the largest producer (Fig. 41). Our export is small.

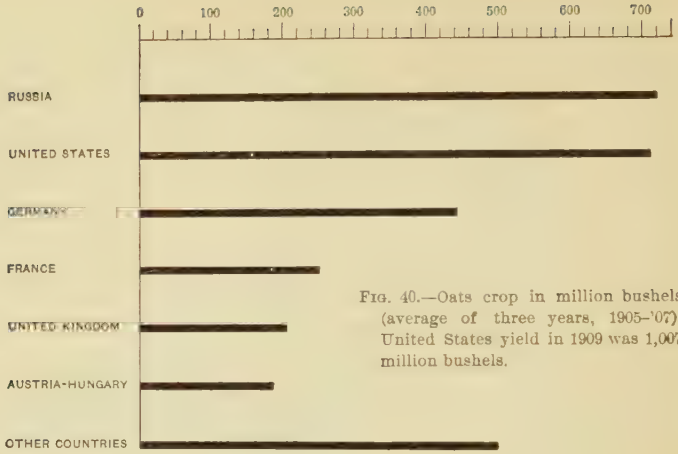


FIG. 40.—Oats crop in million bushels (average of three years, 1905–'07). United States yield in 1909 was 1,007 million bushels.

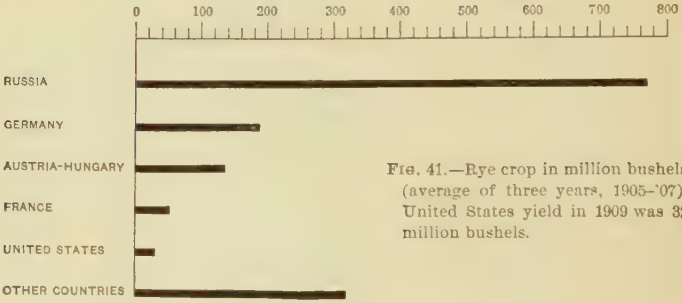


FIG. 41.—Rye crop in million bushels (average of three years, 1905–'07). United States yield in 1909 was 32 million bushels.

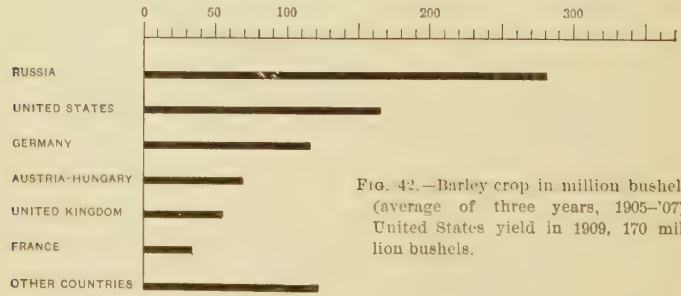


FIG. 42.—Barley crop in million bushels (average of three years, 1905–'07). United States yield in 1909, 170 million bushels.

Barley is most used for beer brewing. In north Europe it is also used for bread and horse feed. Grown from Norway to Algeria, it has a large climatic range, and its culture in England and Germany is about as important as that of wheat (Fig. 42). California raises nearly a fourth of the crop in the United States. Nearly all American barley is malted for beer brewing.

Rice is the main food supply of half the population of the world. It is the largest food resource in southern and eastern Asia (Fig. 43). Two crops a year are grown on Asian lowlands and deltas wherever there is abundant water. The southern coastal plain of the United States, chiefly Louisiana and Texas, supplies about one half the quantity the country consumes. Improved field machinery, the substitution of pumping for natural irrigation, and better processes of milling encourage rice-growing in the United States. The acreage is rapidly increasing.

Buckwheat is grown in Russia, France, and some Alpine districts. Its acreage in the United States has declined one half in thirty-five years.

The sugar of commerce is derived almost wholly from sugar beets and sugar cane (Fig. 38). The Teutonic peoples, particularly the Anglo-Saxon race, are the largest consumers, while the Latin races eat much less. In fifty years beet sugar largely supplanted cane sugar, and thus the greatest producing areas were shifted from the tropics to the temperate zones. But within the past ten years cane sugar has nearly recovered its lost ground.

The beet supplies one half of the total sugar product. North and central Europe make nearly all the beet sugar, and Germany is the largest producer (Fig. 44). The industry thrives in California, Michigan, and on a smaller scale in Utah, Nebraska, and New York. The cane sugar industry was crippled by the abolition of slave labor in the West Indies and the competition of beet sugar. Sugar cane thrives in many warm lands (Fig. 45). Most of the cane

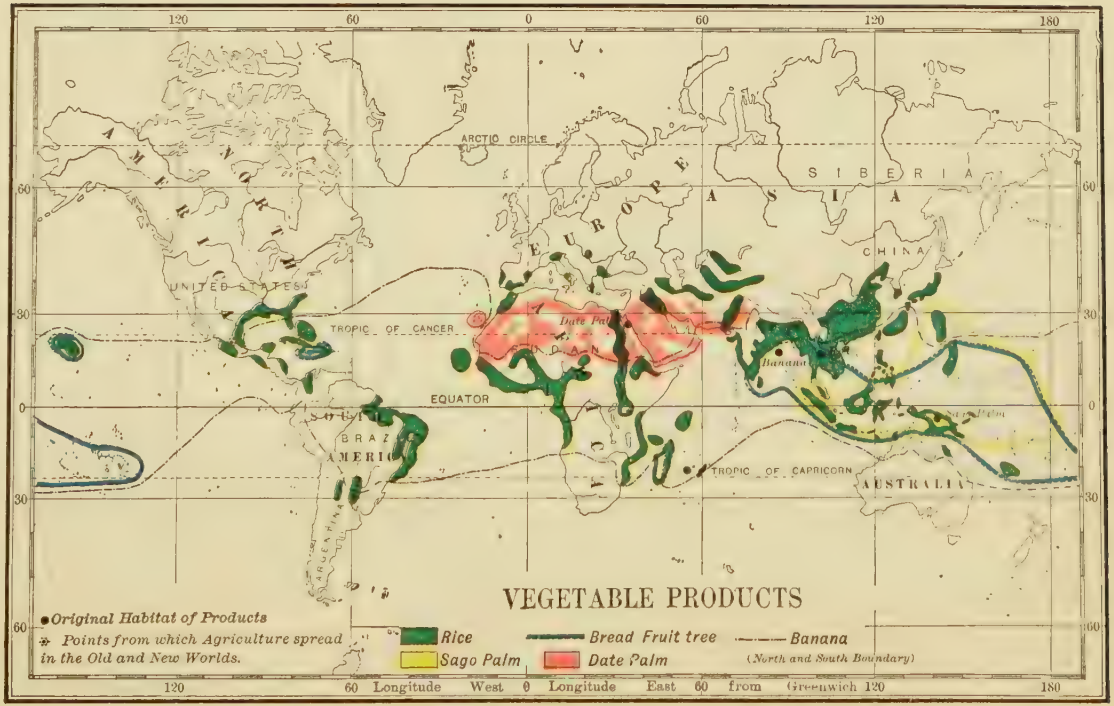

120
60
0
60
120
180
ARCTIC CIRCLE
SIBERIA
EUROPE
ASIA
CHINA
UNITED STATES
TROPIC OF CANCER
Date Palm
Banana
EQUATOR
TROPIC OF CAPRICORN
AUSTRALIA
VEGETABLE PRODUCTS
●Original Habitat of Products
Points from which Agriculture spread in the Old and New Worlds.
Rice
Sago Palm
Bread Fruit tree
Date Palm
Banana
(North and South Boundary)
Longitude West
Longitude East
from Greenwich

FIG. 43.

sugar produced in the United States is grown in Louisiana, on the flood plain and delta of the Mississippi.

Sugar making begins on the farm and ends at the refinery. The juice obtained from the sliced beet by soaking

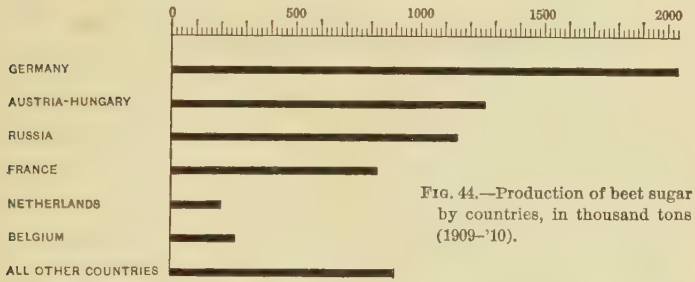


FIG. 44.—Production of beet sugar by countries, in thousand tons (1909–'10).

it in warm water, with which it mingles, and from the cane by crushing the stalk between rollers, is evaporated to eliminate the water. Two products result: raw sugar, brown or yellow in color, and molasses. The raw sugar is sent in

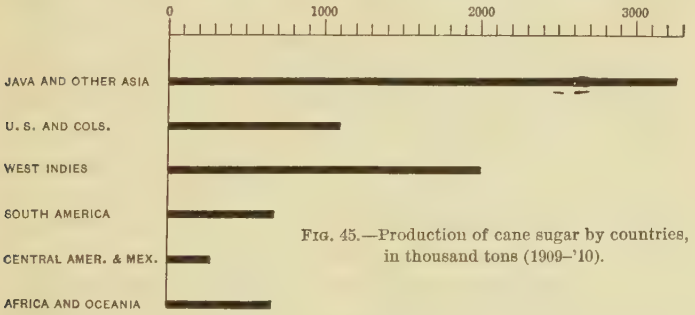


FIG. 45.—Production of cane sugar by countries, in thousand tons (1909–'10).

tierces, hogsheads, and bags to refineries, and is white when ready for market. As the difference between the cost of raw and refined sugar is only about a cent a pound, sugar refining can be profitably conducted only by very large plants turning out an enormous product. It is thus restricted in the United States to a few mammoth refineries in the sea-

ports of Brooklyn, Jersey City, Philadelphia, Boston, Baltimore, New Orleans, and San Francisco, which draw upon all parts of the world for raw cane sugar, and also buy a small portion of the raw product from the sugar beet farms of Europe.

Among lesser sugar products is maple sugar, made from the sap of the sugar maple, chiefly in Vermont, New York, Pennsylvania, and Ohio (p. 75); sorghum, grown in the Mississippi Valley for molasses, a syrup which is also produced in the manufacture of cane and beet sugar on sugar plantations (as West Indies and New Orleans molasses) and in sugar refineries (sugar-house molasses). Molasses is a cheap substitute for sugar, and is also used in the manufacture of rum. Glucose is a liquid sugar produced in the United States from corn starch, and in France and Germany from potato starch, and used for confectionery and for mixing with molasses in the manufacture of table syrups. Various palms in India yield sugar (jaggery).

Sugar is the largest import into the United States. The *per capita* consumption is 82 pounds a year, and this country leads the world as a sugar consumer. All the wheat the country sells to foreign lands does not pay for the sugar it buys from them. Germany supplies nearly all the beet sugar, refined and raw, that the country buys. The United States is the only leading nation which still consumes far more cane than beet sugar (p. 75). The largest part of the cane sugar supply comes from the Hawaiian Islands, the East and West Indies, and South America.

Fast transport and cold storage have stimulated commerce in fresh fruits. North Europe receives fresh grapes in midwinter from South Africa and Australia. California sends grapes, pears, peaches, and apricots to the most distant home markets in competition with nearer sources of supply. The strawberry is the most valuable small fruit in this country. The fruit industry is largely specialized, the peach, for example, thriving mainly in particular localities,

as in Michigan, Delaware, Maryland, and western New York. Fruit preserving and canning is a very large industry. Pineapple raising in Florida, and orange, lemon, and olive culture in California, have diminished tropical and subtropical imports, of which the largest items are bananas from the nearer Latin-American countries and lemons from Italy. Dried fruits, such as currants, raisins, dates, and figs, are largely imported into the United States, as well as into all other northern countries. Dried, green, and ripe apples comprise about one third of the fruit exports from the United States. The United Kingdom is the largest consumer of our fruits, and France, Germany, and Canada are also important buyers.

Root crops and garden truck have little part in international trade. They are too heavy in proportion to value to be worth long-distance transport, but Bermuda sends many early potatoes and onions to the United States. The potato is the staple food of many of the European peasantry, especially in north Germany and Ireland. It is raised in all parts of the United States, but is not so large a feature of the dietary as in Europe.

Several plants yielding beverages are of large commercial importance (Fig. 46). They are (1) those containing sugar or starch, which by fermentation is changed into alcohol (alcoholic drinks), and (2) those whose leaves or seeds infused in water yield a stimulating drink, as coffee or tea. Wine, the most important alcoholic drink, is the fermented juice of the grape. It is the common beverage of south Europe and of France, which is now the chief wine land of the world, Italy and Spain coming next. The cheapest qualities are sold in those countries for a few cents a gallon. The United States produces most of the wine it consumes, California supplying half of it. The industry is growing in importance in New York, Ohio, and some other States. The imports from Europe amount to 6,000,000 gallons a year, and the tendency is to consume less foreign and more American

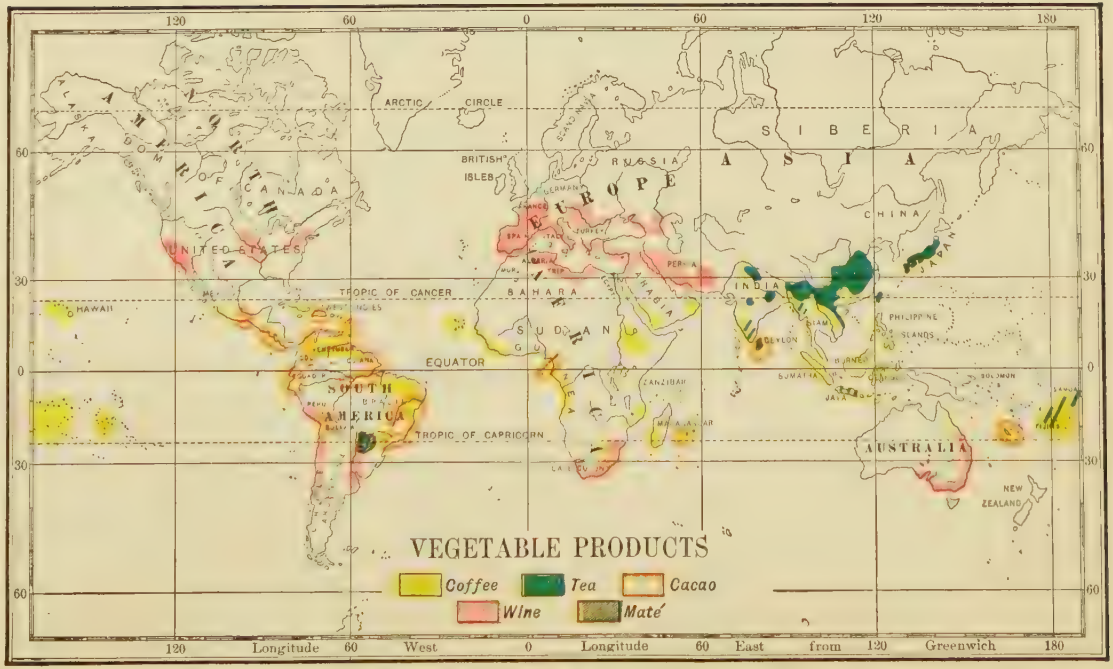

120
60
0
60
120
180
ARCTIC CIRCLE
BRITISH ISLEB
RUSSIA
EUROPE
SIBERIA
ASIA
CHINA
JAPAN
INDIA
PERSIA
SAHARA
SUDAN
GUINEA
ABYSSINIA
ZANZIBAR
MADAGASCAR
TROPIC OF CANCER
EQUATOR
TROPIC OF CAPRICORN
HAWAII
PHILIPPINE SLANDS
CEYLON
SIAM
BORNEO
SUMATRA
JAVA
SOLOMON
AUSTRALIA
NEW ZEALAND
SOUTH AMERICA
UNITED STATES
DOMINION OF CANADA
VEGETABLE PRODUCTS
Coffee
Tea
Cacao
Wine
Maté
Longitude 60 West
Longitude 60 East from Greenwich

FIG. 46.

wine. There is a growing export of California wines to Europe, Japan, and China. Beer, the favorite beverage in north Europe, is made from cereals, usually barley, changed into malt by partial germination, thus converting the starch into saccharine matter; water and hops are added and the mixture is fermented. The chief use of hops is in beer-making, and this crop is grown largely in Europe and America. Germany is the largest producer of beer, Great Britain second, and the United States third. Spirits are diluted alcohol derived by distillation from fermented liquors. They are used as a beverage or medicine, and have special flavors, according to the origin of the alcohol. Thus brandy is distilled from wine, whisky from various grains, as corn and rye, and rum from the juice of the sugar cane and molasses.

Non-alcoholic beverages contain caffeine, to which they owe much of their stimulating quality. The infusion of the roasted coffee bean (Fig. 46) is one of the most widely used beverages in North America and north Europe. Over three fifths of the world's crop come from Brazil. In the United States over 11 pounds *per capita* are annually consumed. Brazil supplies about three fourths of the coffee imports of the United States (p. 75). The business of roasting the bean and distributing the commodity over the country is very large. Tea (Fig. 46) is the dried leaf of the hardy, evergreen tea bush. The various qualities are the result of differences in the size of the leaf, the season of picking, and the method of preparing and mixing; thus the differences between black teas, preferred in Great Britain, and green teas, preferred in the United States, are the result of different methods of treating the leaf. The United Kingdom, which is the largest tea-drinking nation, buys nearly half of all export teas, its supply coming mainly from Assam, Bengal, and Ceylon. Japan produces green tea for the most part, and the crop is largely exported to the United States, which also buys much tea from Formosa

and China. The cacao tree (Fig. 46) grows chiefly in tropical America, Brazil and Ecuador being great producers. Its most important product is chocolate, made from the large nutritive seeds, which are roasted, crushed, and flavored; the decoction cocoa, a wholesome and nutritious beverage, is valued in many lands. Nearly all the cacao imported into the United States is the crude product, and it is manufactured here into chocolate and cocoa.

Tobacco is grown in the temperate and torrid zones (Fig. 35). The many gradations in its quality are due to differences in climate and soil. The so-called Havana tobacco of Cuba, for example, is famous for its aroma and is used only for cigars; the mild tobacco of north and central Europe is best adapted for the pipe; the fine, bright leaf of Sumatra is largely used as wrappers for Western-made cigars; European Turkey and Anatolia grow a yellow leaf with a peculiar aroma, used in the best qualities of Turkish and Egyptian cigarettes; Mexico and Brazil raise excellent tobacco, and India is the second largest producer. Most cigars and the best cigarettes are made by hand, but less expensive cigarettes, as well as chewing and smoking tobacco and snuff, are manufactured by highly perfected machinery.

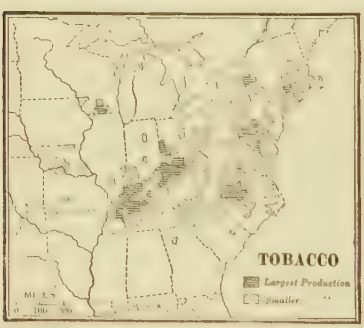


FIG. 47. Tobacco in the United States.

The United States is the largest tobacco grower (Fig. 47). It is grown in many States, from southern Wisconsin, which produces a large crop, to Louisiana, which raises the famous perique. The largest tobacco area, about 600 miles long and 400 broad, extends from Kentucky to Maryland, and from central Ohio to North Carolina. Most of the ex-

port manufacturing tobaccos (chewing, smoking, and snuff tobaccos) are raised in this area; but most of the leaf used for making domestic cigars is grown in the more northern States. Cigarettes, chewing and smoking tobaccos and snuff are manufactured in large factories, the great centers of the industry being Richmond, Petersburg, and Lynchburg, Va., Wheeling, W. Va., and Durham, N. C. Richmond, in the heart of the rich tobacco district, with easy access by water and rail to the coast, is the chief tobacco city of the country, and exports three fifths of the manufactured tobacco sent to foreign markets. Cigars are made in thousands of factories, large and small, scattered all over the country. Much Havana leaf is imported, and though its manufacture is widely distributed, the largest center of its use is Key West, Fla., where native Cubans make Key West cigars under climatic conditions most nearly approaching those of Cuba. The prevailing humidity and warmth in Cuba promote not only the growing but also the manufacturing of tobacco. Few cigars are exported, but a large amount of unmanufactured leaf is sold in Europe and Canada, and important quantities of tobacco manufactures are sent to British Australasia, north Europe, Japan, and China. Owing to the extensive importation of Havana leaf and cigars, Cuban and Sumatran leaf, and Egyption cigarettes, the tobacco exports are smaller than the imports. In 1900 we used 379,000,000 pounds of leaf tobacco in manufactures. Our yield in 1909 was 949,000,000 pounds.

Hay is one of the largest products of the country. Its value is equal to that of the wheat, or four fifths that of the corn crop. It is most important in the cattle-raising States of the corn belt and California, and in the dairying States of New York and Pennsylvania. Some baled hay is sent to the United Kingdom and other countries.

There is need of better farming. There are over 6,000,000 farms in the United States and about 9,000,000 people live on them. More than half of our farm lands have been used less than fifty years. Men may need these lands for millions of years to come, and we should use them so that they will not be stripped of their fertility.

Most of our farmers, in the past, have not returned to the soil the elements of plant food taken from it by crop-raising. On many farms in our prairie states we have grown crop after crop of wheat, selling it at a dollar or less a bushel and leaving the land poorer after every year. In 1909, the yield of wheat to the acre in our country was 13.8 bushels; in Germany, 28; in the United Kingdom, 32.2.

Europe has long depended more upon the United States than on any other country to make up its deficiency in breadstuffs; but in 1908, Argentina sent more wheat to Europe than we did; and, if we continue to impoverish our farm lands, we shall be compelled, some day, to import wheat to feed our rapidly increasing population.

But our country will not continue the bad policy of taking from the fields all they will yield and giving them little or nothing. The story of English farming teaches us a lesson many nations may study with profit. One hundred and fifty years ago, the soils of England had been overcropped and underfed so long that they gave no fair return for the farmer's toil. Then began the era of feeding the soil sufficiently, and, as knowledge grew, better ways of crop rotation and farm management became the practice, so that to-day no soils in the world are more productive than the once depleted farm lands of England. Our own farmers, also, in the future, will give earnest heed to methods and agricultural arts by which farm fertility will be maintained.

This better era will come because our country has awakened to the need of reform in agricultural methods. Great effort is being made to induce our farmers to adopt more in-

telligent and profitable practices. Twenty-five of our sixty agricultural colleges have already organized departments for the extension of the kind of practical knowledge which farmers need. It is estimated that 200,000 persons in New York State alone will attend the farm institutes and conventions to be held in 1911. Demonstrations of better methods are being conducted in many of the states. Sixty-one experiment stations, all over the country, are studying a great many questions relating to farm methods, fertility, and prosperity. These and other agencies are doing great good. It is necessary that this campaign of education shall be carried on till it reaches every farmer in the land. President Van Hise says * that, by proper methods of farming and by improving the seed used, our yield of corn may be increased from an average of 25.5 bushels to more than 50 bushels to the acre; the yield of wheat may be increased to at least 30 bushels per acre; the yield of oats to 50 bushels per acre from the present yield of 30.3 bushels; and the yield of barley to 50 bushels from 24.3 bushels. The yield of cotton may be twice as great. In other words, it is certain that the yield of all these standard crops may be doubled.

The new farming methods will require the most careful husbandry of all kinds of fertilizers. Western lands may learn much from the practice of China, Japan, India, and other densely peopled countries which allow nothing to go to waste that will enrich the soil. In China even the straws and other refuse on the roads are taken to the fields. Phosphates are one of the three great elements in fertility, and it is estimated that the loss of phosphorus carried by our city sewers into rivers and lakes is equal to about half the output of our phosphate mines. Some other countries are saving this sewage for fertilizer, and we will have to apply sewage directly to the soil or separate the phosphates from it, if we are to conserve the fertility of our land.

* "The Conservation of Natural Resources in the United States."

CHAPTER IX

THE UNITED STATES—(*Continued*)

Animal Food Products and the Trade in them; also the Horse, Whales, Sponges, and Furs

Domestic animals are raised for food in largest numbers where land is cheap and pasture abundant. Cheap pasturage therefore largely determines the sources of meat supply. Land is costly and animal-raising expensive where population is dense and industries well developed; such regions therefore depend for much of their animal food upon distant lands. Thus the chief sources of supply for a large part of Europe are America and Australia. But it would not be worth while to carry meat far from the cheap pastures if it could not be kept from spoiling. Without means of preserving meat the vast areas of grazing lands in the interior of the continents would have no importance in the fresh meat trade.

The world's meat trade has been greatly extended by processes for preserving flesh. It is practicable by means of these expedients to send meat to markets that are thousands of miles away. Meat is preserved either by refrigeration, canning, salting, pickling, smoking, or sun-drying. The resulting conditions are unfavorable to the life of the minute organisms that cause putrefaction. Meat has been refrigerated since 1875, by freezing or chilling in the ice chambers of storage houses or on cars or on shipboard; or by allowing compressed air to expand in the meat rooms, the air being thus reduced in temperature to any desired degree. Slaughtered beeves are sent from the United

States to Europe in chilled rooms, freezing not being necessary on the Atlantic voyage, though essential in crossing the tropics from South America and Australia.

Cattle are raised in the United States chiefly for food. In India, on the other hand, they are raised more for draft purposes and hides than for food; and hides and tallow are the main products of the industry in parts of south Russia, South Africa, and Argentina. The abundance of herbage and grains and the healthful climate provide most favorable conditions for cattle-raising in the United States, where the herds are almost wholly free from diseases. The result is that the United States raises twice as many cattle as any other country except India, and nearly all of them are fatted for slaughter or kept for the dairy industry. Oxen for draft purposes have greatly declined in number.

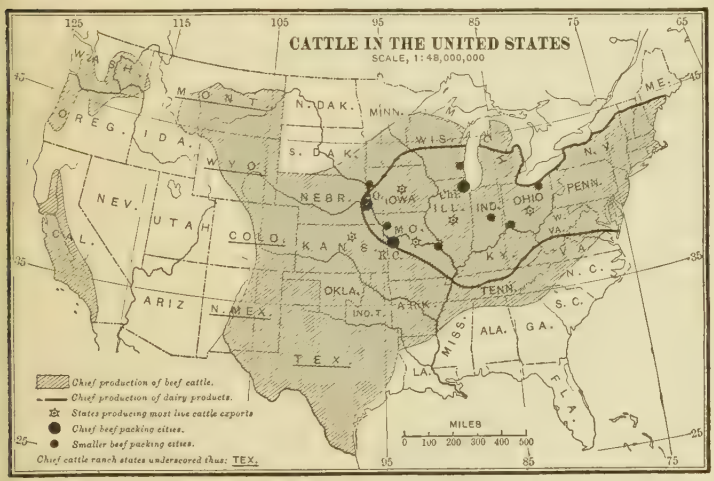


FIG. 48.

The main sources of beef cattle are the corn belt and range states (Fig. 48). A farm of 160 acres in the corn belt will supply enough forage and grain to send to market

several times as many fat cattle as can be raised on the same area in the range or ranch states of the Great Plains, which, however, have an abundance of nourishing grasses, when not overstocked, to produce healthy and superior beeves. About 1860, settlers along the streams began to turn their stock out to graze on the sub-arid plains with such profitable results that large companies were formed to raise millions of cattle. The poorly watered plains thus became a source of national wealth. Great areas were stocked with the longhorn Texas cattle of Spanish origin, but better animals were finally introduced, to the great improvement of range cattle. Number of cattle (1910), 69,000,000.

Most of the live beef cattle sent to market are fattened in the corn belt or Eastern states. Many are shipped to the large towns of the country and to Europe. The United Kingdom buys most of the live cattle exports (p. 90). Before 1875 her entire foreign supply of live cattle came from Holland, Germany, and other European countries; but the United States now furnishes nearly three fourths, and Canada and Argentina the remainder. Live animals sent to Europe require good food, care, and comfort on shipboard, or they do not arrive in good condition. Very few live hogs are exported, and not many sheep, except to the United Kingdom.

Most of the beef cattle come from the Western states. The cattle are shipped to the mammoth slaughtering establishments of the West (Fig. 48), and the meat is forwarded in refrigerated cars to many hundreds of towns and cities, where it is placed in cold storage and thence distributed to consumers. In this way, for example, 150,000 summer boarders in the Catskill Mountains have an abundant supply of fresh beef. The export trade in refrigerated beef is nearly two thirds as large as the live beef export trade, and the United Kingdom buys nearly all of it. Beef canning began on a large scale in 1879, upon the perfecting of a sure method of hermetically sealing tins; but the

THE OLD WAY.

THE NEW WAY.

BUTTER MAKING.

canned beef and salt or pickled beef trades (beef packing) have largely declined with the growth of the refrigerated beef industry.

Most of the dairy products are consumed at home (Fig. 48). The shorthorn and other of the best milking breeds of Europe have been largely imported to improve our dairy stock. Since 1860 a great impetus has been given to dairying (1) by the establishment of cheese and butter factories, which make superior and more uniform products; and (2) by the invention of the centrifugal machine for separating cream from milk, which reduced the cost of butter-making. The greatest production of butter and cheese is in the dairy states of the West (Fig. 48), where the direct consumption of milk is not so large as in the Eastern states. Only about one fourth of the butter is as yet manufactured in factories, but most of the cheese is now a factory product. Exports have declined in recent years, owing to former shipments of inferior products and partly to the vast development of dairying in Canada, which is the largest cheese exporter in the world. The export of butter, once confined to neighboring countries, has, through refrigeration, become world-wide, but our country has not yet given sufficient attention to this trade to command an important part of it. Denmark exports three times as much butter and cheese as the United States sends abroad. A large quantity of the finest cheeses of Europe are imported, most of them from Switzerland, Italy, France, and the Netherlands. The milk yield is about 83 gallons a year *per capita*, and a considerable part of it is sold direct to the consumer, the largest trade being in the Eastern states.

Oleomargarine, a substitute for butter, prepared from various animal fats, is an increasing manufacture, and is also exported to some extent. It may be sold only under its own name. Animal tallow is the solid fat of ruminant animals, commercially derived almost wholly from oxen and sheep. The best quality is used for candles and other

grades for soap-making, leather-dressing, lubricants, etc. Nearly all the export tallow of the United States goes to Europe, the United Kingdom taking more than a third of it (p. 91).

About one third of the swine in the world are raised in the United States (Fig. 29). Germany, Austria-Hungary, and Russia are the next largest producers, but their combined product is less than that of this country. More than one third of the corn crop is turned into hog products (Fig. 49). Hogs are the staple of the meat-packing industry, which

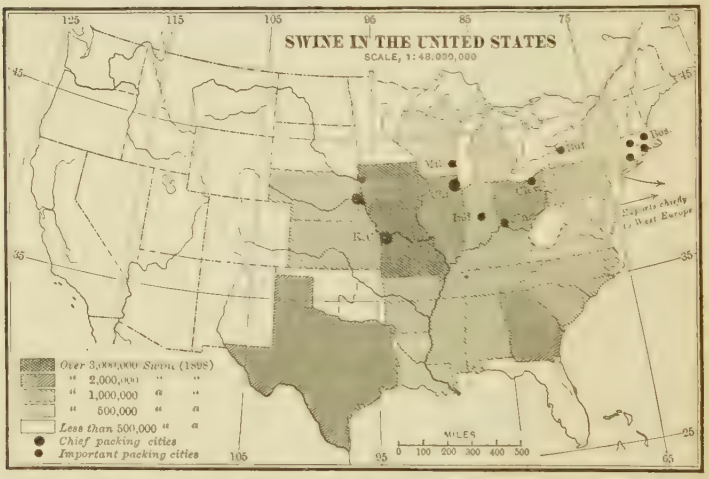


Fig. 49.

is associated at the slaughtering centers with the killing, dressing, and shipping of cattle and sheep; but as beef-packing has declined (p. 79), the industry chiefly relates to hogs. Chicago, Kansas City, and Omaha are the largest centers for the slaughter of cattle, sheep, and hogs, and the packing of hog products, because they are most conveniently situated to receive cattle and sheep from the ranges, and cattle, hogs, and sheep from thousands of farms

in the upper Mississippi Valley. They control the meat trade of the country, though a great many smaller cities slaughter for local consumption. The preparation of the meat for market is largely assisted by machinery at a great saving of time, labor, and expense. As the hogs are killed, one set of men prepare the animals for the chill rooms at the rate of twenty a minute. Refrigeration has made the packing season twelve months long, and summer-cured meat does not differ materially from that killed in winter. Little goes to waste. Hair is sold for mixing mortar, bones are carbonized and sold to sugar refiners or turned into a fertilizer; sinews are used for glue, small bones for knife handles, and intestines for sausage casings. Sausages are made in most cities and towns, pork and beef mixed being the chief ingredients. Europe buys most of the fresh pork, lard, ham, and bacon exported, and the United Kingdom is in each case the largest consumer. Lard, hog fat expressed from the tissues containing it, is among the largest exports of hog products. North America, chiefly the West Indies, buys most of the salt and pickled pork sent out of the country.

Sheep are raised in the United States more for wool than mutton (Fig. 29). The value of the sheep sold for food and pelt is about one half that of the wool produced. Wool growing is most important in the Eastern and central states. It is also a large industry on the plains, where sheep have partly supplanted cattle. They graze so closely as to leave no feed for cattle, and this fact occasions many conflicts between cattle and sheep interests. Several million sheep are slaughtered every year at the packing centers West and East, and the dressed mutton, distributed in refrigerating cars, is practically all consumed at home.

The horse is bred chiefly for farm work and other traction (Fig. 29). It was brought to America by the early explorers, and has been much improved by admixture with European draft breeds, as the Clydesdale, Percheron, and Norman.

The trotting horse or roadster and the thoroughbred, evolved for racing by long and careful breeding, are raised on many stock farms. Horses, till 1894, were exported to Europe almost solely for breeding and the race track, but there has since been a growing export of draft horses to European cities, Great Britain buying about one half and Germany one sixth of the shipments (p. 90). The breeding and use of mules are mostly confined to the Southern and some Western states. War in foreign countries stimulates the export of mules. Thus the Spanish Government became for a time the largest buyer of mules after the Cuban revolt of 1895. Horsehide makes good leather, and is used for razor strops, shoe uppers, and gloves. The supply is chiefly from American cities. Horsehair is used in upholstery; carcasses are turned into fertilizers. Horse meat has been sold in Paris since 1870 at half the price of beef, and there is a small consumption in Belgium and Germany. Mare's milk is used as food in inner Asia by Mongolians and other nomad peoples. Kumiss, fermented mare's milk, is a common beverage in the same regions and is imported into Western countries.

Poultry and eggs figure largely in international trade. The United Kingdom buys, in about twenty countries, 40 per cent, or 1,500,000,000 a year, of the eggs consumed. Russia, the largest exporter of eggs, sold 1,475,000,000 in 1896, of which one fifth was sent to the United Kingdom. Japan produces few eggs, but imports many from China, where they are very cheap. The business of fattening chickens for the British market is of great value in northern France and Canada. Eggs are exported from the United States in important but variable quantities. The home supply of poultry and eggs suffices for domestic uses. Value of our poultry products is about $600,000,000 a year.

The fishing industries are mainly near the coasts of the cooler northern seas (p. 91). Here the cod, herring, shad, salmon, and other varieties swarm in great numbers to spawn

in shallow sea waters or in estuaries and rivers; edible fish are also found in nearly all salt and fresh waters having suitable temperature and food resources. Each nation, by international agreement, reserves for its own fishermen all fishing rights in the sea within three miles of its coasts; outside of this limit the sea fisheries are open to the world. Cured fish, preserved by drying, salting, or smoking, has the advantage of small bulk and highly nutritive qualities, but the demand for fresh fish is also constant. Fresh fish had formerly to be sold as soon as it reached market or it became worthless. This waste has been stopped by refrigeration. The largest sea fisheries are those of the Atlantic coasts of the United States, with the neighboring coasts of Canada and Newfoundland (Fig. 50) and those of western Europe (Fig. 51).

The cod is commercially the most important of fishes (p. 92). Newfoundland, Canada, and Norway export great quantities of it, salted, to many lands, and particularly to the Roman Catholic countries of southern Europe and Latin America. Its liver yields a valued medicinal oil. The largest cod fisheries are on the Grand Banks of Newfoundland, whose shallow waters abound with food for cod (Figs. 50 and 51). Thousands of fishermen from Newfoundland, Canada, the United States, and France ply their vocation in small sailing vessels on the foggy banks, catching the fish by hand lines, cleaning and salting them at once and drying them in the sun on platforms after the return to port. They are sold chiefly in this form, but a small part of the salted output is shredded after removing the bones, packed in small boxes and sold as boneless cod. There are also inshore cod fisheries near the British American and United States coasts, those along our New England shores supplying most of the fresh cod in the home markets; but the inshore fisheries are declining in importance. Gloucester, the largest fishing port of the United States, supplies a large part of the salted cod found in every grocery store of

the country; practically all the cod entering our ports is consumed at home.

Canned salmon is sent to all parts of the world. The salmon is caught in seines and traps in the rivers which it

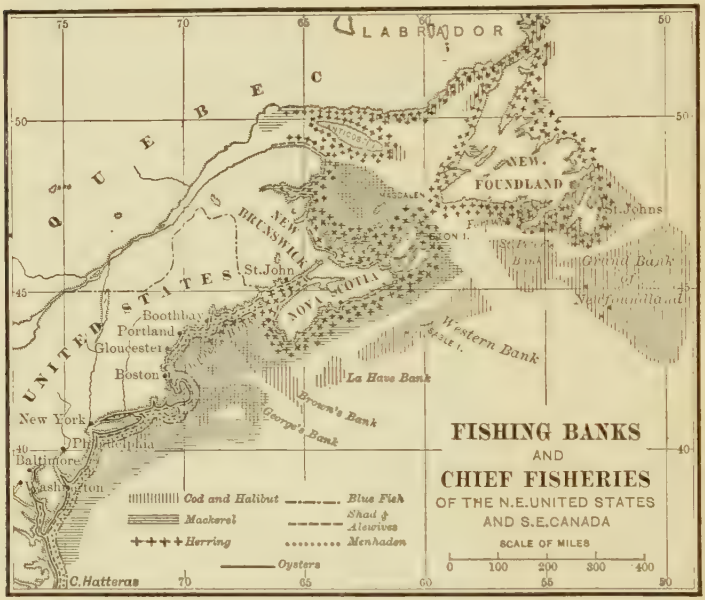


FIG. 50.—The shad (herring family), one of the best American food fishes, is found from Florida to the St. Lawrence, and caught in stake nets and seines in many rivers which it ascends in the spring to spawn. The shad fisheries of Chesapeake Bay and its tributaries are the most valuable, yielding nearly half the product. The Delaware estuary, and the Hudson, Connecticut, and Kennebec are important shad rivers. Alewives enter many rivers from Maine to Florida, are very cheap, and the greater part are salted or smoked. The highly-prized bluefish is scattered widely through the warmer waters of the Atlantic and Indian Oceans, but its chief commercial importance is along the Atlantic coast of the United States. The halibut, a very large fish, is caught with lines on either side of the Atlantic, but mainly on the Grand Banks in winter and near Greenland and Iceland. The menhaden is used very little for food, but a large quantity of oil and fish guano is produced from it in factories built for the industry.

ascends to spawn. The largest salmon fisheries are in the Columbia and other rivers of the northwest coast of the

FIG. 51.

United States, including Alaska, and in the Fraser and other rivers of British Columbia. Most of it is cooked and canned, though it is also refrigerated and delivered fresh in the Eastern markets. The canning industry in Alaska.

the largest in the world, extends to Bering Sea, is steadily growing, and in twenty years over 600,000,000 pounds of salmon were canned there. The fish is also largely caught in British, Norway, Russian and Japan waters.

The herring is caught in close-meshed nets on the northwest shores of Europe and the coast of North America from Maine to Labrador (Figs. 50 and 51). Most of the Norway and British product is sent salted to the Continent. In America the herring is smoked, pickled, or salted; and the industry is large on the Maine coast, whence the cured fish are sent in boxes or barrels to Boston, New York, and Norfolk for distribution. Small herrings, called "sardines," are packed in oil after the manner of the true sardine, one of the most important food fishes of south and southwest Europe. Our sardines are cheaper than the imported article, which formerly came wholly from France. Three quarters of them are now from the Maine herring fisheries. The mackerel is found in great shoals on the coast of eastern North America and northwestern Europe (Figs. 50 and 51). Most of the New England catch is salted, but in Europe it is usually eaten fresh. Spanish mackerel is procured from the warmer waters of both sides of the Atlantic and is highly esteemed.

The Great Lakes fisheries are west of Buffalo. Lake Ontario is no longer a factor. The whitefish is most valued, and two thirds of the catch is whitefish, the so-called herring trout, and sturgeon from which American caviare is made. Caviare is the prepared and salted roe of several species of sturgeons. Its manufacture is a large industry on the Caspian and Black Seas. The streams and small lakes of the country also yield an abundance of trout, pickerel, and other varieties.

Most of our fishery products are consumed at home. Nearly every coast town is a fish market; and though Billingsgate, London, is the largest fish market in the world, no foreign market offers so great a variety as New

York, Philadelphia, Boston, and Chicago, which receive and distribute salt and fresh water fish from all the coasts and the Great Lakes. Canned salmon is the largest fish export of the country, and many sardines from the Maine canneries are sent to the West Indies and South America. Mackerel, sardines, and herrings are the imports of most importance, but the country supplies most of its fish food.

The oyster is the most important shell food. Shellfish thrive best in warm waters and in the north temperate zone; are most abundant in quiet, shallow estuaries or bays, like those in which the oyster thrives along our Atlantic coast from Massachusetts to Virginia, and to a smaller extent along the Gulf coast. These oysters are the best and largest in the world. As the natural supply does not keep pace with the growing demand, millions of young oysters are transplanted to private beds controlled by companies, and in this way oyster culture is being extended on the Atlantic and introduced on the California and Oregon coasts. Small steamers and sail boats anchor over the beds and take the oysters with "tongs," or dredges, from depths of ten to twenty-five feet, where they lie on the bottom, fattening on the food that the tides bring to them. The Chesapeake and Long Island beds are the largest sources of supply, and the yield of this country is about five sixths of the world's oyster product (p. 92). In the nine months of the season, beginning in September, oysters are sent fresh to most of the markets. Though oyster canning has been largely superseded by refrigeration, many cove oysters of the Southern states are still canned in Baltimore and elsewhere and distributed to the smaller interior towns. The increasing exports are shipped between September and April, and Great Britain buys about 3,000 barrels a week in the season.

The lobster, caught in baited wicker traps from Labrador to Delaware, and also along the northwest European and Mediterranean coasts, is sent to market alive or canned.

New England waters having been largely depleted, most of our canned lobster now comes from Canada and Newfoundland. At low tide many men and boys dig clams that bury themselves in the mud flats along the New England and Long Island coasts.

The sperm and right whale are most important in the whale fisheries. The sperm whale supplies the best grade of whale oil, and is usually caught in the warmer parts of the oceans. Spermaceti, a pure white mass from which sperm candles and ointments are made, is derived from the head cavities of the sperm whale. The blubber of the right or Greenland whale yields train oil, but the main incentive for still hunting this scarce animal is whalebone, the horny fringe attached to its upper jaw, worth about $3.50 a pound. It is caught in the Arctic Ocean near Bering Strait and west of Greenland by a few San Francisco and Dundee whalers. Large fortunes were once made in whaling, but the industry is now small, owing to the scarcity of whales, the introduction of mineral oils, and substitutes for whalebone such as steel, celluloid, and rubber.

The sponge of commerce is the fibrous framework remaining after the fleshy part of the aquatic organism from which it is derived has been washed away. Most sponges, and those of the best quality, come from a depth of 150 to 200 feet in the Mediterranean and Adriatic, along the coasts from Ceuta, Morocco, to Trieste, Austria. In deep water they are procured by diving. In the shallow waters of Florida and the Bahamas sponges are torn from the bottom by three-pronged forks. The Florida fishery has an area of 3,000 square miles, with Key West as the largest center of the trade. The product is sent in bales to New York wholesalers.

The finest furs are obtained in the subpolar and polar regions. In those cold latitudes Nature provides animals with the thickest coverings. Canada, Russia, and Siberia are the largest sources of the most valuable furs. In Canada

and Russia the supply is decreasing, while in Siberia the catch of sable, otter, red fox, and other furs and skins has increased, which means that Siberia is now the least hunted of the great fur fields.

About 1,000,000 skins of the Siberian gray squirrel, taken every year, supply most of the squirrel fur used in lining cloaks. Australia and New Zealand export enormous numbers of rabbit skins. The muskrat, skunk, raccoon, mink, opossum, marten, sea otter, and various foxes and bears are now the largest source of American furs and skins. Persian lamb skins are much used for ladies' jackets, and there is a constant demand for the Russian and Hudson Bay sable. Several kinds of monkey skins, together with the skins of lions, tigers, and other large carnivora, are the contributions of subtropical and tropical countries.

The seal fur was for years one of the most useful and popular of furs. The Alaskan seal fisheries, on the Pribylof Islands, was the largest source of supply, though now greatly depleted. The males are killed near the breeding grounds. The skins are then salted, dried, baled, and shipped to San Francisco and thence to London, where the long hairs are plucked, the fur is dyed, and is then ready for the market. As the manufacture is mainly carried on in England, much of the profits of these seal fisheries go to that country.

Furs are collected for sale to manufacturers at several great centers. London is the largest fur auction market; Leipzig holds spring and autumn fairs, when German wares are exchanged for the skins of Russia, Austria, and Turkey, the advantage of this market being its convenient position in respect of the sources of supply; the great Russian market is at the Nizhni Novgorod fair, where manufacturers buy the furs of north Russia and Siberia. Fur garments are more in demand in east than in west Europe, where the climate is milder.

Fur is well adapted for felting, and nine tenths of the felt hats worn in the United States are made from the fur

of the rabbit and hare; the nutria of Argentina, beaver, muskrat, raccoon, and otter are also used.

The fur manufacturers of the United States turn out superior products to the value of about $20,000,000 a year. More than half of the business is centered in New York city. The long, cold winters of Minnesota stimulate considerable manufactures there. Large quantities of undressed furs, which are on the free list, are imported for manufacture in this country, more than half the supply coming from the United Kingdom and Germany; and those countries, with France, send most of the fur manufactures.

STATISTICS FOR THE UNITED STATES

	1880.	1890.	1909.
Value of animals, meats, and dairy products exported (in million dollars)	148.6	250.9	189.1

	1850.	1872.	1880.	1890.	1894.	1904.
Hogs packed (in millions).	1.7	5.9	12	17.7	16	22.3

It is now (1911) regarded as possible to raise domestic animals in most regions where large numbers of grass-eating wild animals live and thrive. An enormous number of caribou, for example, feed in parts of the Alaskan interior, and from this fact it is inferred that cattle raising will some day be important in portions of the territory. Countless grazing animals roam over the wide, high plains of British East Africa, and the settlers say that these lands are equally well adapted for the raising of cattle and sheep. A large part of the 1,200,000 acres taken up by white settlers in that colony is devoted to stock raising. Governor Sadler, in a recent speech, said that public game preservation must not be permitted to impede the development of the country by white settlers and that changes in the game laws are under consideration with a view to increasing the area of stock farming.

For ten years (1901–1911) the best breeds of European cattle have been taken to Africa for the improvement of the native cattle, with the result that in some tropical regions more milk and better beef per animal is now obtained. On the whole, however, the experiment has not been very successful, for the mixed breeds are quite susceptible to disease. It is so important, however, that these food resources should be in adequate supply for the whites, that the experiments are continued. One of the latest phases is the importation of a breed of Zebu cattle from India, famous both for milk and meat, to cross with the native stock.

It is expected that parts of the Tropics in which the heat is modified by the elevation of the land will contribute largely to the supply of wool. This is highly desirable because, in temperate lands, as density of population increases the value of land rises till it is impossible to use it profitably for sheep raising. This is the reason why the number of sheep in Germany decline from 21,000,000 in 1852 to 8,000,000 in 1906 and, in the United Kingdom, from 44,000,000 in 1828 to 29,000,000 in 1906. It is now certain that millions of sheep will be raised on the highlands of Tropical Africa for wool as well as for meat. The experiments with wool sheep on the high plateau of British East Africa are most encouraging for the future of the industry.

The rearing of domestic animals has made great progress because centuries of experience have given man great skill in their care and improvement. A constantly increasing number of useful animals, adapted for man's purposes and fitting in with their local environment, are raised. The facts that the camel may be reared in the desert, that the ostrich, sheep, goat, horse, and others thrive on the steppes, the yak on the high plateaus, and the Indian buffalo in swampy areas helped to adapt many regions that were uninhabitable or partly so to the uses of man; thus he makes use of domestic animals to reduce the natural disadvantages of many regions.

Because fodder may be scarce or overcropped many

herders change the feeding places in different seasons of the year. Fodder is saved for bad years. Means are found to hasten the growth and development of animals. The production of milk and eggs has increased. Scientific breeding of Arabian horses, for example, tends to produce breeds of fast horses—more capacity for speed than nature has given. This is done to free man from the natural constraints of time. In order to improve the quality of work specialization is necessary; thus from the donkey and the horse, the mule was produced.—*Wirthschaftsgeographie,* by Ernst Friedrich.

CHAPTER X

THE UNITED STATES—(*Continued*)

Vegetable and Animal Fibers—Oils from the Seed of Fiber Plants

Cotton, wool, silk, and flax provide clothing for the larger part of mankind. Most of the cloths worn or used are made of cotton or wool. All these fibers compete with one another in trade. An unusual consumption of one fiber affects trade in the others, but the competition is mainly between cotton and wool and cotton and flax. Cotton is the white, soft fiber that surrounds the seeds of the cotton plant (Fig. 35). It is easily and cheaply grown

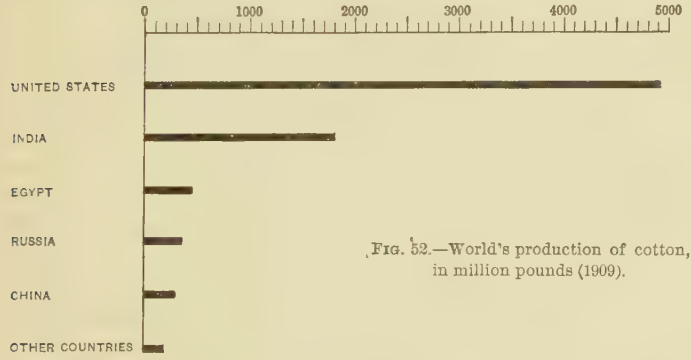


Fig. 52.—World's production of cotton, in million pounds (1909).

in tropical and, best of all, in warm temperate climates. The plant requires a long, hot summer and abundant rainfall. On account of its cheapness and other advantages,

cotton has won the first place among textile staples. Civilized nations now use for clothing five times as much cotton as was used in the first half of the nineteenth century, and nearly half the people of the world are supplied with cotton goods made by modern machinery (Fig. 52). Though widely cultivated in America, Africa, and Asia, only a few lands send raw cotton to the great manufacturing countries.

About three fourths of the cotton is raised in the United States (Fig. 53). It is the great product of the cotton belt in the southeastern part of the country.

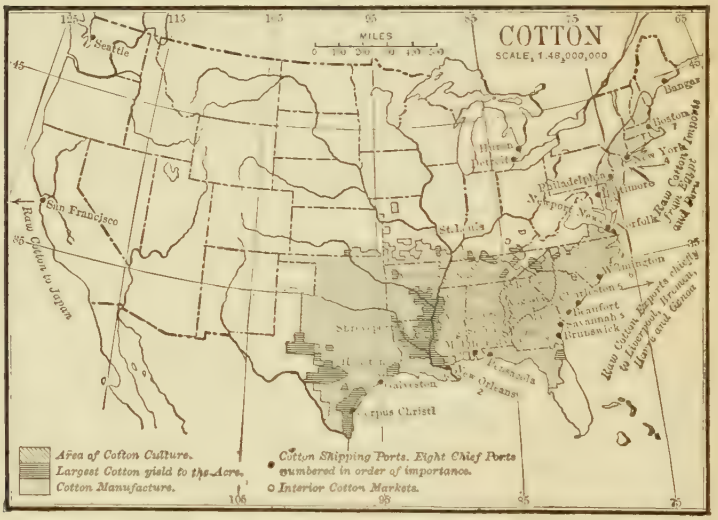


FIG. 53.—Cotton in the United States.

Negroes are most numerous in the cotton states because the larger part of the African slaves brought to the Union were imported to work in the cotton fields. The value of the crop is exceeded only by that of wheat and maize, and in some years it is worth more than the wheat crop. The varieties of cotton best known in the world's markets

are (1) our long staple sea-island cotton, grown on the islands and coasts, particularly between Charleston and Savannah, and used for thread, laces, and fine cambrics; and (2) the shorter staple, upland cotton, grown in the interior of the cotton belt. A large part of the machine-made cotton fabrics of all countries are manufactured from this upland cotton, which is known abroad as American upland, or simply American cotton. Its price in Liverpool, the largest foreign market for it, regulates the price of cotton throughout the world. The northeast coast of Brazil sends to Europe much cotton of longer staple than American upland. Other raw cottons are used in America and western Europe only for special purposes, as Egyptian cotton, with long, fine fiber, for thread, fine yarns, underwear, and hosiery; and the rough Peruvian cotton, mixed with wool, in the manufacture of underwear, hosiery, and cloths. The cotton of India is too short to equal American cotton for spinning fine yarns.

Cotton is taken from the field to the cotton gin, the great invention of Eli Whitney (1793), which stimulated cotton raising by doing away with the slow and costly hand process of freeing the fiber from the seed. It is then packed in bales, the average weight of which is 430 pounds, and forwarded to market towns, most of them in the interior (Fig. 53), where brokers sell it on commission to the agents of home and foreign buyers. Cotton bought for export is sent at once to the seaports, where the wharves are filled with cotton bales from September to January. Galveston begins to move cotton first because its supply comes from the Texas fields, where the season is early, but in October the crop pours into New Orleans, Savannah, and other ports by thousands of bales a day. Cotton for New England and Canadian mills is sent by land and sea in about equal parts. As cotton mills are rapidly increasing in the Southern states, 2,500,000 or more bales a year are retained there. United States cotton spindles (1909), 28,000,000.

Liverpool and Manchester, the largest European cotton markets, buy one half of our export raw cotton. Bremen is the most important of the Continental markets, but Havre, Genoa, and Trieste also do a large trade (p. 105). Raw cotton is admitted free of duty in England, Germany, and France, but is dutiable in Russia and Italy.

One third of the home cotton crop is made into fabrics in the United States. Cotton spinning and weaving—great household industries for centuries—were mainly transferred to factories about the beginning of the nineteenth century (1) by the invention of the "spinning mule," enabling one operator to attend to hundreds of spindles; (2) the power loom, which abolished hand weaving; and (3) the application of steam to manufacturing. A loom introduced since 1890 saves half the labor cost of weaving. Most of these great inventions for making cotton fabrics were later introduced into wool manufactures. The prices of cotton and woolen fabrics have been declining for thirty years, owing to improved labor-saving machinery and to the decline in the price of wool.

In spinning, the thread or yarn is made by drawing out and twisting the fiber. One operator often attends two machines, each of which is spinning many threads. The yarn is then taken to the loom for weaving. The threads extending lengthwise of the piece are called the warp, and those across it, the woof. The woof threads are woven into the warp by means of shuttles, which are driven rapidly back and forth between the warp threads.

Coarse and medium cotton fabrics are in largest demand in the domestic market. These goods, therefore, such as calico, sheetings, shirtings, gingham, and cotton flannel, are the largest product of American cotton mills. The New England states, with Massachusetts leading, are the largest center of cotton spinning and weaving (Fig. 53), and their mills consume about one fifth of the total crop. Many large towns were built up in New England by the

A COTTON FIELD IN TEXAS.

cotton industry, nearly all of them on streams, whose water power was utilized, as Lowell, Lawrence, Manchester, and Nashua on the Merrimac; Lewiston on the Androscoggin; Augusta and Waterville on the Kennebec; Biddeford on the Saco; Fall River on the river of that name; and Woonsocket on the Blackstone; but many cotton mills now use steam exclusively. Coal, cotton, and other supplies may be taken to Fall River, New Bedford, Providence, and other mill centers on or near Narragansett Bay at less cost than to points in the interior, and these advantages have made Fall River the largest center of the cotton industry. There were 1,077 cotton mills in the country in 1905.

The Southern states trebled the capacity of their cotton mills in the last decade of the nineteenth century. About 400 mills are situated near or in the cotton fields, mainly along the fall line (p. 54), from Virginia to Alabama, but many also are in towns nearer the sea. They have the advantage of raw cotton at their doors, cheap fuel and labor, and find home markets for practically all their calico and other cotton products. Many knitting and woolen mills scattered among the cotton factories supply hosiery, underwear, woolen blankets, cloths, and carpets. Goods for which Southern merchants formerly went to New York are now sold to them from the local mills, and Southern cotton fabrics, as well as raw cotton, are shipped direct from the South to China and Japan.

The export trade in cotton fabrics (p. 105) is constantly growing, but is still small in comparison with that of the United Kingdom, which sells to foreign lands eight to ten times the value of cotton goods that the United States exports. About one half of all the raw cotton exports of the world are sent to the British Isles, because that country has had the longest and largest development in cotton manufactures. China, the largest buyer of American cotton cloths, takes nearly half of our exports, most of them going to Shanghai for distribution in the Yangtse valley and the

northeast provinces. About one half of the manufactured cotton imports are laces, edgings, and embroideries.

The price of wool since 1860 has declined in all markets. This is due to the vast increase in the number of sheep in Australasia, South Africa, and Argentina, where pasturage is very cheap, and winter feeding is rarely required, and also on the free grazing lands of our western plains (Fig. 29). The world's wool clip has increased 150 per cent.

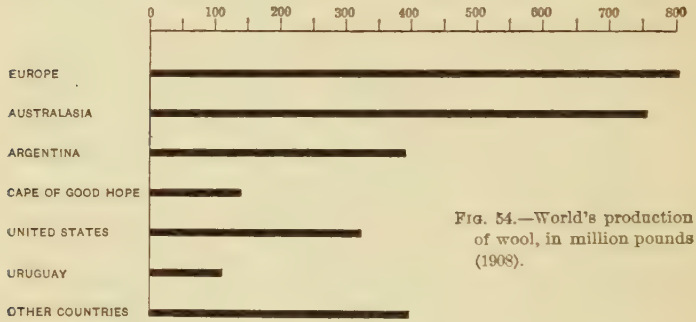


FIG. 54.—World's production of wool, in million pounds (1908).

since 1875. The consequent reduced price of wool and the diminished cost of manufacturing processes have greatly cheapened woolen fabrics (Fig. 54).

The United States, originating a wool fiber that is mainly Spanish merino, has long been noted for strong staple fabrics, for which this material is well adapted. More than three fourths of the sheep in the country are pure or mixed merino. The merino, originating in Spain from a cross of African and native stock, is noted for the fineness and length of its wool. American flocks supply few superfine wools, and these qualities are mainly imported. As the domestic wool clip is not sufficient for the needs of manufacturers, who work up 350,000,000 to 500,000,000 pounds a year, about one fifth of the quantity consumed is imported. No manufacturing countries produce the amount of wool they need, and their deficiency is mainly supplied

by Australia, New Zealand, Argentina, and South Africa. The larger part of the wools brought into the United States are made into carpets, the United Kingdom and China supplying half of the carpet wools, while Australia, the United Kingdom, and Argentina send nearly all of the imported cloth wools. Boston is the largest wool market, because it is the most convenient center of distribution to the mill towns of New England.*

New England and the Middle states are the largest centers of woolen industries, New England operating one half, and Pennsylvania, New York, and New Jersey one third of the total woolen machinery. Some towns have special advantages for woolen mills, as Philadelphia, where the Schuylkill river water is peculiarly adapted for woolen manufacturing.†

American woolen factories form four groups according to the nature of their products: woolen, worsted, carpet, and felting mills. Some mills also make a specialty of dyeing and finishing woolens. The largest products of the woolen mills are cloths for men's suitings, a great part of which are purchased by makers of "ready-made" clothing, and

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* The wool or hair of Angora and Cashmere goats, the alpaca, vicuña, and camel are also used in wool manufactures. South Africa exports a great deal of mohair, the long, fine, silky wool of the Angora goat, now extensively raised in Cape Colony. Most of the material from which the famous Cashmere shawls are made is the downy covering next the skin of the Cashmere goat. The soft, elastic wool of the alpaca, domesticated on the Andean plateaus, gave rise to the large alpaca cloth industry. The vicuña is not domesticated, and its wool, though highly prized, is in small supply. Camel's hair, mixed with other yarns, is used in making shawls, carpets, and some other fabrics.

† There are very many woolen mills, but the largest centers—in order of importance—are Philadelphia, Lawrence, Mass., Providence, R. I., Lowell, Mass., New York city, Manchester, N. H., Camden, N. J., and Chester, Pa. Philadelphia is the chief woolen center of the United States.

dress goods for women's wear. Most of these goods are of medium quality, but many compare favorably with the best foreign goods; the high cost of labor in American mills, however, counts more against the production of the finest grades of woolen and other textiles than of the cheaper grades because of the extra care, skill, and labor required in finishing them. American flannels and blankets are unsurpassed, and practically fill the home demand.

The worsted mills produce merinos, serges, and other stuff goods, hosiery, and knit goods. The United States makes more machine-made knit goods than all other nations combined. Americans wear far more of them than any other people; Cohoes, N. Y., is the largest center of their manufacture. Cotton, wool, and silk, either separately or mixed, are used in these manufactures.

The carpet mills have made the United States the greatest carpet-manufacturing nation, no other country producing so large a quantity and variety. The quality is excelled only by the handloom products of Oriental countries. Philadelphia's carpet product is greater than that of all the rest of the country combined, but Lowell, Hartford, New York city, Yonkers, N. Y., and some other cities are conspicuous in these manufactures. Most of the factories produce ingrains, but the more expensive varieties are made in large quantities, and the annual product, worth $50,000,000, nearly fills the home demand.

Felt mills turn out felted wool, a material produced by matting wool through the application of heat, moisture, and pressure, and used for floor coverings, hats, and some other purposes. Both the production and importation are now small, because hatmakers have found fur better suited for felting (p. 89).

The woolen products of America have not yet won an important place in foreign trade. They are nearly all consumed at home; and there are purchasers also, in spite of heavy duties, for about $10,000,000 worth a year of British,

French, and German cloths for men's wear, and dress goods for women and children.

The silk of commerce is derived from the cocoon of the Chinese silkworm. It is the only caterpillar reared for its silk. The cocoons of several wild species in India and Mongolia yield tussar silk, which is imported into Europe. The Chinese silkworm feeds for forty days, between the time it is hatched and the time it spins its cocoon, upon mulberry or osage orange leaves. It is then busy from three to five days spinning its cocoon, when the larva is killed by heating the cocoon. The light yellow raw silk is reeled and sent to market in skeins, just as the animal spun it, except that the gum that binds all the threads together is softened by immersing the cocoon in hot water, and then, in reeling, several of the very fine threads, passing through the fingers of the operator, are united into one by this gummy substance. About a thousand perfect cocoons yield a pound of raw silk. There is no cheap raw silk. It must fulfill required conditions as to weight and strength of fiber or it is not accepted. Spun silk, however, an inferior quality, is obtained from damaged cocoons, or the outer covering of the cocoon, and is spun like other fibers, while raw silk is not spun. Raw silk is prepared for manufacture by boiling, to extract the gum and other extraneous matter, and "throwing," a series of operations by which the too delicate fiber is twisted and doubled into a more substantial thread, called thrown silk, when it is ready for the loom. Other operations require the dyer, printer, and finisher.

China and Japan are the largest sources of raw silk, but sericulture is an industry of many countries, and is highly developed in Italy and France (Fig. 55). Raw silk might be extensively produced in the United States if wages were not high, but home-grown silk could scarcely compete, for example, with Italy's product, where girls are hired to reel raw silk at 1 cent an hour. China sells large quantities of

silkworm eggs to European growers. The United States consumes about one third of the world's supply of raw silk (p. 106).

The United States is the second largest manufacturer of silks. Since 1860 it has built up an industry that supplies its people with four fifths of the silks they use. Most of

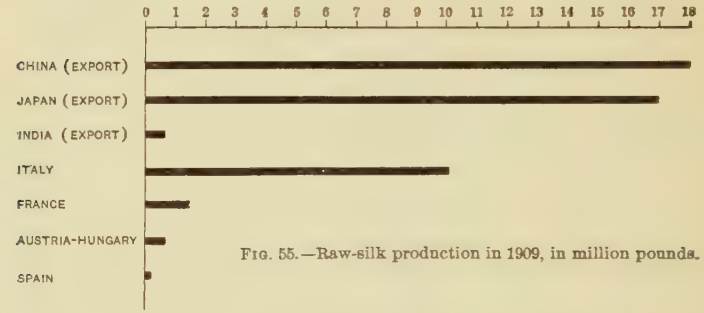

FIG. 55.—Raw-silk production in 1909, in million pounds.

the mills are in New Jersey, New York, and Pennsylvania (p. 106), but the industry is pursued in nineteen states. About half the product is in broad goods, a quarter in ribbons, and most of the remainder in sewing silks. Paterson, N. J., "the Lyons of America," and the greatest center of the industry, has the largest ribbon mill in the world. The silk manufactures amount (1911) to over $133,000,000 a year, and practically all are consumed in the country. The import of manufactured silks is only about one fourth of the home manufactures (p. 106). Most of them are from Lyons, Krefeld, Zurich, and Japan. New York is the greatest raw-silk market except Shanghai.

Flax is grown for its fiber and seed. The best fiber is produced in southern Belgium, while Russia surpasses all other countries in the quantity raised. It is grown in the United States mainly for its seed (linseed). Nearly all the fine flax goods used, such as laces and linens, are imported from Europe.

A number of other fibers are important in commerce. Hemp, mostly grown in Europe and India, is widely used for rope and sail cloth. The "garden hemp" of Italy is the finest, Russian hemp, the strongest and, for most purposes, the best. Henequen and Manila hemp have largely supplanted hemp in the United States. The so-called Manila hemp, derived from a species of the banana, thrives only in the Philippines. It yields a strong, coarse fiber, the best and cheapest material for cordage and sail cloths. The United States and Great Britain buy most of it. Henequen, or sisal hemp, is the only large export product of Yucatan. About 70,000 tons are sent to the United States every year for cotton sacking. Jute, grown almost entirely in the delta region of the Ganges, has a glossy coarse fiber that mixes well with silk, and takes a bright and permanent coloring. It is used for gunny bags—in which many commodities are transported—for carpets, and recently in curtains, and even plushes and velvets. Raw jute and its products are sent to the United States in large quantities. Dundee, Scotland, is the chief seat of jute manufactures, and nearly all the jute that India raises is exported raw or manufactured. Esparto (alfa in Algeria), a grass growing spontaneously in Spain and Algeria, is sent to Scotland and England for paper-making, and Spain turns the fiber into rope, baskets, and matting. Ramie, or China grass, of the nettle family, is grown in China, Japan, Paraguay, and the Malay Archipelago for coarse fabrics and cordage. New Zealand flax or phormium is another fiber used for paper, cordage, and fabrics.*

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* The oil seeds of several fiber plants give rise to large industries. Cotton-seed oil is a substitute for butter or lard in cookery, or for olive and some other oils. More than $15,000,000 are annually paid to Southern planters for their cotton seed, which is sent to mills that express the oil. New Orleans is the largest center of the industry. The residue, after the oil is expressed, is the oil cake and oil-cake meal of commerce, used as cattle feed or a fertilizer. About a fourth of these

Paper is made from vegetable fibers. The fibers, reduced to pulp, mat together when freed from the water used in the pulping process. Linen and cotton rags, wood, straw, paper waste, and esparto are the fibers used. Wood pulp is the largest source of paper stock where great forests of spruce or poplar exist, as in the United States, Canada, and Germany. Printing, writing, and wrapping papers are the most important kinds, but paper is made into a great variety of articles, such as boxes and wall paper, and is moulded from the pulp into building materials, pails, and car wheels. The chief paper producers are the United States, Germany, and Great Britain.

The United States is the largest producer of paper. The enormous consumption in the country is due mainly to the great number and size of newspaper and other periodical publications. Fifty paper mills, most of them in New York, New England, Wisconsin, and Oregon, near sources of wood-pulp supply, make 3,000 tons of news paper a day. Nearly all the news paper is made of wood pulp, and an area half as large as Rhode Island is stripped of pulp timber every year to supply the paper mills. Massachusetts manufactures more than half of the writing and other better grades of paper, mostly made of linen and muslin rags. Holyoke, Mass., is the largest center of the industry. The publishing of books and periodicals is centered, to a great extent, in New York city, Boston, Philadelphia, and Chicago.

This country exports more than twice as much paper and its manufactures as it imports. Great Britain is the largest buyer of our news, book, and writing papers. This

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three products is shipped to Europe. Linseed oil, the oil of flaxseed, is the largest ingredient of paints, and is used in the manufacture of oil cloth and printer's ink. Most of the product in the United States is controlled by one company. All of the domestic linseed is consumed at home, and in some years large quantities are imported. Hemp-seed oil is also used in making soaps, paints, and varnishes.

country, and all the leading European producers of paper, except Great Britain, Russia, and Spain, export more paper than they import.

WORLD'S COTTON STATISTICS

Mean Annual Factory Cotton Consumption (in Million Tons)

	1831–'40.	1851–'60.	1871–'80.	1909.
United Kingdom	1.59	3.85	5.63	9.59
Other Europe	0.79	2.45	4.27	8.52
United States	0.37	1.45	2.74	7.83

Cotton Spindles (in Millions)

	1893.	1908.		1893.	1908.
Great Britain	45.2	52.8	United States	15.6	27.5
European continent	26.8	39.5	India	3.5	5.7

It now seems assured that Africa will be a great source of cotton for the factories of Europe. Years of experimentation have shown that a large part of British East Africa is well adapted for this crop. In Nyasaland, American Upland is a commercial success and is the variety now recommended. German East Africa is importing seed from American Upland grown in Nyasaland, as it is thought that the plant thrives better than that from seed imported from our country. Large tracts are under cotton cultivation in Uganda. The natives prepare the land, sow the seed and bring a raw material to market that for length of staple and general quality compares favorably with any cotton in the world. The Uganda crop for 1908 sold for $250,000. In West Africa, the cotton crop in Togo in 1909 showed an increase of thirty-two per cent over the previous year. The cotton experts who have been studying the prospects of cotton in Northern Nigeria assert that there are 24,000,000 acres in the colony which will grow the quality of cotton that Lancashire requires.

United States Wool Statistics

Value of United States Wool Manufactures (in Million Dollars)

1850.	1860.	1870.	1880.	1890.	1905.
49.6	80.7	217.6	267.2	337.7	380.9

Value of Imported Wool Manufactures (in Million Dollars)

	1898.	1909.		1898.	1909.
Dress goods	6.9	6.7	Clothing	0.8	1.4
Cloths	3.8	4.8	Knit fabrics	0.6	0.6
Carpets	2.0	4.0	All manufactures	15.2	18.1

Value of Raw Silk imported (in Million Dollars)

	1898.	1899.		1898.	1899.
From Japan	12.5	20.9	From Italy	7.1	9.3
China	4.5	10.8	All countries.	26.5	42.7

Value of raw silk imports in 1909, $80,000,000.

Distribution of Silk Mills in 1900

New Jersey.	New York.	Pennsylvania.	Other States.	Total.
180	92	121	90	483

Value of United States Silk Manufactures (in Million Dollars)

1850.	1860.	1870.	1880.	1890.	1905.
1.8	6.6	12.2	41	87.3	133.3

Value of Imported Silk Manufactures (in Million Dollars)

	1898.	1899.		1898.	1899.
From France	10.6	12.2	From Japan	2.7	3.2
Germany	4.6	4.9	United Kingdom	2.7	2.5
Switzerland	3.8	3.9	All countries.	25.2	27.8

Value of imported silk manufactures in 1905, $32,812,000.

CHAPTER XI

THE UNITED STATES—(*Continued*)

Wood Crops, the Commodities they yield, and the Trade in them

The foremost wood-producing countries are the United States, Canada, and Russia. Most of the wood supplies are derived from the great forest areas of the north temperate zone which girdle the land surface between the arctic circle and the 30th parallel (pine and leaf trees, Fig. 4). The wood crops of two countries in this forest zone, the United States and Canada, give employment to more persons than any other industry except agriculture; and the lumber, furniture, and other kinds of business depending upon the wood crops employ more capital and produce a larger value of products in these countries than any other manufacturing industry. We have only to look about us, in our homes or outside of them, to realize that a large proportion of the conveniences of life are, wholly or in part, made from forest products.

The largest element in the timber trade is the soft and hard pines, which are most important for lumber and general building purposes. Observe the pine areas in Fig. 4. The white pine is the most useful timber of the north temperate zone. The greater part of the wooden buildings in the United States are made of white pine lumber. Much lumber for building purposes is also made from the spruces; and the bark of the hemlock spruce is used in tanning leather. Hard woods are less employed for lumber than

soft woods, but they are extensively used for the woodwork of machinery, house trimmings, floors, furniture, ship fittings, and ornamental purposes.*

A crop of timber takes about a century to mature, and like any other crop, needs care. The forests have largely diminished because their resources have been utilized for ages, with no care to replant the denuded lands. Thus the necessity has arisen for forestry methods by which timber lands are systematically replanted and tree culture extended. In most European countries and in India forest management is under government control, and laws provide that replanting must immediately follow cutting. Over 8,000,000 young forest trees were set out in 1896 in denuded districts of Switzerland. In America the ravages of fire have, in twenty years, inflicted $800,000,000 of damage upon the timber lands. Overcutting has largely exhausted the white-pine supply, and this great staple of the lumber trade will entirely disappear unless the pine lands are replanted. The Federal Government and several states of the Union are now applying forestry methods, so that future generations may benefit by forest wealth.

Lumber is the largest product of the forests. As it is very heavy and bulky in proportion to value, it requires cheap freight rates to carry it profitably to the markets. This is the main reason why the pine and spruce lumber of our Pacific coast has scarcely reached the Central and Eastern

* The walnut, maple, oak, chestnut, beech, and hickory are characteristic hard woods of North America and Europe. Ebony, a black wood from Ceylon, Madagascar, and India, is very hard, takes a high polish, and is used in fine furniture. Teak, the finest wood of India and Indo-China, lasts for many centuries. The white ants of tropical lands do not attack this timber as they do many others, and so it is used for building in hot climates. It is also employed for the woodwork of war ships, as projectiles do not splinter it. The bamboo of South Asia, the mahogany of tropical America, the kauri pine of New Zealand, and the now widely distributed eucalyptus of Australia are also among the important timbers.

states by rail, though it is sent thousands of miles by sea to foreign markets. The fact that our largest lumber industries are near the splendid highway of the Great Lakes cheapens the price of this commodity.

The United States is the largest producer of lumber (p. 114). The greater part of the country yields more or less

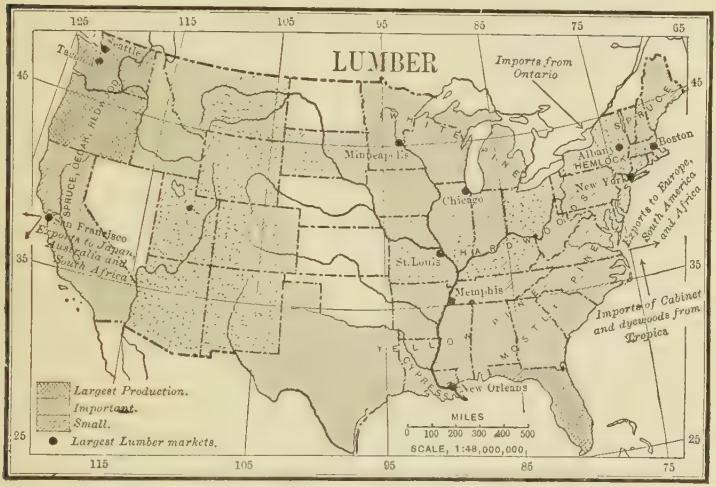

FIG. 56.—Since 1865 the pineries of Michigan, Wisconsin, and Minnesota have furnished most of the white pine, which supplies a tenth of the total lumber output. White pine made Chicago, with its unequaled water and rail facilities for receiving and distributing lumber from these pine states, the largest lumber market in the world. Spruce is obtained in many places along the northern border, but Maine, New Hampshire, and the Adirondacks supply most of it, both for lumber and wood pulp. Boston, Albany, and New York city being nearest to the main sources of supply, are naturally the largest spruce lumber markets. Hemlock lumber and bark come from southern New York and northern Pennsylvania, and near the forests are many tanneries that use the bark in tanning leather. The Southern pines are a large source of lumber. The most important varieties are the yellow or Georgia pine and the short-leaf or loblolly (North Carolina and Virginia pine), which supply Southern and many Northern markets. Southern sawmills are scattered from Texas to Virginia, and New Orleans is a large market for Southern lumber. The spruces, cedar, and redwood of the Pacific coast furnish one tenth of the lumber. The Douglas fir of the Northwest supplies a large part of the world's demand for ship masts and spars, and is widely used for bridges. The hard woods contribute nearly a quarter of the lumber supplies. The main sources of hard wood are now south of the Ohio and east of the Mississippi, with St. Louis and Memphis as the largest markets.

abundant supplies (Fig. 56). The lumber taken from our forests every year, if all used for house building, would build several million houses; but lumber is also used for a great many other purposes. The large snowfall in the northern pine forests helps to cheapen lumber making, because it gives easy haulage from the logging camps. The timber is cut in these camps in winter, hauled on sleds over the snow to the banks of streams, and floated in great log drives in the spring, to the hundreds of sawmills where the lumber is manufactured. Improved saws and other machinery have vastly increased the facility with which timber is turned into lumber. Steamboats, rafts, and railroads carry the product from the sawmills to the large lumber markets. Sawed lumber is about four fifths of our total lumber product.

The United States consumes more timber and lumber than any other country, and is the largest buyer from other lands. About a fourth of its imports are mahogany and other cabinet woods, admitted free of duty, and coming almost wholly from tropical America. The cheap production of lumber and wood pulp in Canada enables that country, in spite of the duty, to sell large quantities to the United States. Tonawanda, on the Niagara River and Erie Canal, and Oswego on Lake Ontario, are the most important points for the receipt of Canadian lumber. Canada and tropical America supply nearly all our imported forestry products.

The country exports more lumber than it imports (p. 114). Many populous countries are deficient in timber, which is profitably exported by sea for thousands of miles. Europe is the largest buyer. While Germany's home supply of lumber is nearly sufficient, France, Great Britain, Italy, Spain, Portugal, and Belgium use much more wood than they produce, and supply their deficiencies by imports from the large forest countries near them—Russia, Norway, Sweden, and Austria-Hungary, and also from Canada and the United States (p. 114). Latin America has few sawmills, and few soft woods that compare favorably with our

LUMBER INDUSTRY.

LOGGING IN THE NORTH WOODS

pines. These southern countries therefore supply a larger market for our lumber than for most other commodities of the country. The soft lumber of the Pacific coast is sent in large quantities from San Francisco and Puget Sound ports to Australia, China, Japan, and South Africa.

Furniture valued at over $150,000,000 is annually manufactured in the United States. The largest cities, such as New York, Chicago, and Philadelphia, are the chief centers of the industry, but some small cities, as Grand Rapids, Saginaw, and Muskegon, Mich., are exceptions to this rule. In these cities the superiority of the timber resources near at hand for furniture making gave rise to very large industries. Only New York, Chicago, and Philadelphia produce more furniture than Grand Rapids; and buyers from all over the country attend the semi-annual sales in that city. Nearly 8,000 factories of all kinds are distributed through the country, the larger part of them, as in the Southern states from Memphis, Tenn., to Montgomery, Ala., near the forests that supply the lumber. Large quantities of the finer grades of foreign furniture were formerly imported, while home factories supplied the cheaper lines; but the best qualities of furniture are now made at home, and prices being low, the exports are much larger than the imports.

Various gums and resins are obtained from trees. Tar, turpentine, and resin (commonly called rosin) are known as naval stores, and are mainly supplied by the pine forests of North and South Carolina and Georgia; smaller quantities are produced in Russia and Scandinavia. Tar, a thick, black fluid, distilled from the wood by heat, is used for calking ship decks and sides, and in preparing the rope rigging of vessels. Turpentine, an oily, resinous substance secreted by the wood or bark, is obtained by tapping the tree and collecting the outflow (crude turpentine), the distilled product of which (spirits of turpentine) is manufactured at Wilmington, Newbern, and Beaufort, N. C., and other towns near sources of supply. Turpentine is used in

the preparation of varnishes and paints, and to some extent in pharmacy. Rosin, the residue left after distilling the turpentine, is used in varnishes, yellow soaps, etc. Practically no naval stores are imported into the United States, but this country sends large quantities of crude turpentine and spirits of turpentine to Europe, and of rosin to Europe and Australasia (p. 114).*

Many trees and vines yield india rubber or caoutchouc. The sources of supply are tropical countries in South and Central America, West and Central Africa, and British India. Rubber was not utilized till 1770, when artists in England began to employ it to erase pencil marks, from which fact it derived its name. When rubber fabrics were first manufactured the rubber melted in summer and cracked in winter. Then Charles Goodyear discovered the secret of vulcanized rubber or the application of sulphur and heat to make raw rubber an article of practical utility. This established the rubber industries on a prosperous basis about the middle of the nineteenth century.

The United States spends about $80,000,000 a year for rubber and very greatly increases its value by turning it into many articles. More than half the rubber shipped from the Amazon basin, which supplies two thirds of the world's product, is brought by the United States (p. 115). Europe takes the remainder. A third of the crude rubber is made into shoes and boots. The United States manufactures six times as many rubber shoes and boots as the whole of Europe, for the reason that everybody in this country wears "rubbers," while their use in Europe is con-

* Other gums and resins, mainly produced in Southern Asia, are imported to the value of over $7,000,000 a year, such as gum arabic and gum tragacanth for mucilage, camphor for medicinal uses, copal and damar for varnishes, gambier for tanning leather, and shellac, from which the best sealing wax is made, a secretion caused by the lac insect on the branches of trees in India and other tropical countries. Shellac has the leading place among the imported gums.

fined to persons of means. Many other articles are made of rubber, as bicycle tires, belting, blankets, combs, and buttons. The manufactures are mainly confined to Massachusetts, Rhode Island, and Connecticut. Nearly all the output is consumed at home, and manufactured imports are very small.

Gutta-percha is the hardened, milky juice of a large tree thriving mainly in Java, Borneo, and Sumatra. The tree is cut down to obtain the juice. No satisfactory substitute for gutta-percha has been found for coating submarine cables. The demand is now greater than the supply, as the resources of Sumatra and Borneo are nearly exhausted. The imports into this country are comparatively small.

Some trees and other plants yield dyestuffs. These coloring materials are now obtained artificially from a product of coal-tar (p. 119), and the natural dyes, therefore, are of less importance than formerly.*

The cinchona tree yields quinine (Peruvian bark). It is highly valued for its curative effects in malarial fevers. Though a native of the Andean regions of northern South America, particularly Peru and Ecuador, it has been planted largely in Ceylon, Java, and India, whence the greater part of the drug is now derived. The imports into the United States are valued at about $1,000,000 a year.

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* Logwood, from the West Indies, is most used for dyeing wool and woolen goods and in the manufacture of ink. The indigo plant of India and Central America yields a very valuable blue dye, and the imports exceed those of all other dyestuffs together. It is also artificially produced from benzene, derived from coal tar. Madder, cultivated in southern Asia, Europe, and the United States, is used for dyeing cloth red. Quercitron, a yellow dye from the bark of a variety of the oak, is employed in calico printing. Fustic, or yellow wood, from tropical America is employed in wool dyeing. The red Brazil wood is imported from Central and South America, and the more valued camwood comes from West Africa. Cochineal, an animal dyestuff, derived from an insect which is brushed from the cactus in Mexico, Central America, and Peru, is used to produce scarlet and other red tints.

The cork tree flourishes in Spain and Portugal. Manufactured cork being dutiable, most of the cork used for bottling in the United States is prepared in the country, from imported cork wood or bark (p. 301).

FOREST AREAS IN CHIEF COUNTRIES (IN MILLION SQUARE MILES)

Canada	1.2	Sweden	0.07	Norway	0.03
United States	0.8	Germany	0.05	Spain	0.02(?)
Russia	0.6	Austria-Hungary	0.04	Italy	0.02
Finland	0.09	France	0.04		

The conservation of the forests has become a problem. It is estimated that 23,000,000,000 cubic feet of timber are taken from our forests every year. The waste is enormous, and about a fourth of the timber is lost in cutting it into logs. The loss in milling and manufacture is still greater and much study is now being given to the problem of more economically handling our forests.

The most tremendous source of waste, however, is forest fires, hundreds of which occur every year, the loss of timber thus destroyed amounting to about $50,000,000 per annum. The problem of the control of forest fires is also under consideration and, by means of fire patrols and other agencies, some progress has been made in checking these fires. Large areas of the Government domain have also been set apart as forest reserves so that the timber may be conserved; and a great amount of planting trees is being done in various parts of the country. Many years will elapse before the remedial measures now being put into force will supply us with a large additional growth of timber per annum. But it is expected that the conservation methods that are beginning to be employed will, if steadily practiced, result in the maintenance of an adequate timber supply for the country.

IMPORTS OF CRUDE RUBBER (IN MILLION DOLLARS)*

	1898.	1899.
From Brazil	13.3	18.4
United Kingdom	6.5	6.8
Germany	0.8	1.1
Other Europe	3.5	5.3
Other South America	0.7	1.0
Central America	0.6	0.8
East Indies	0.2	0.3
All countries	25.9	34.2

Total imports of crude rubber, in 1909, 88,359,895 pounds.

VALUE OF PRINCIPAL SAWMILL PRODUCTS IN 1900
(IN MILLION DOLLARS)

Rough lumber	385.3	Laths	4.7
Cooperage	20.7	Furniture stock	1.9
Shingles	19.0	Carriage and wagon stock	1.8

Total value of lumber produced in 1908, $510,575,000.

* Millions of rubber plants are being set out in the Congo Independent State by the government and the rubber collecting companies. The law requires that a certain number of plants be started for every ton of rubber collected.

The *Hevea Braziliensis* from which Para rubber is derived is regarded in many regions as the rubber plant that can most successfully be transplanted. Its cultivation in West Africa and parts of India, Ceylon, and the Straits Settlements (1905) is promising excellent results.

World's rubber production in 1906, about 65,000 tons.

Consumption of rubber by principal countries in 1904: United States, 26,470 tons; Germany, 12,800; Great Britain, 10,000; France, 4,130.

CHAPTER XII

THE UNITED STATES—(*Continued*)

Coal, Petroleum, Iron Ore, Tin, and their Products

Minerals are not accessible more than a mile below the earth's surface. Rapidly increasing heat as depth is attained confines mining to the upper rocks. But the natural forces that uplift many rock strata bring mineral commodities within reach that were once inaccessible. Rain and other denuding agencies also wear away rocks till mineral wealth is exposed on the slopes of mountains and hills. Minerals are likely, therefore, to be mined first on the windward sides of mountains; as, for example, the gold washed into valleys on the west side of the Sierra Nevadas, and tin on the west side of the mountains in the Malay Peninsula. Mineral commodities are obtained by quarrying if the works are open and visible at the surface, as is usually the case with building stone and much iron ore; or by mining if it is necessary to dig into the earth and bring the product to the surface through shafts.

Coal and its product, coke, are the best fuel for iron-ore smelting. This fact gives coal its largest economic value, as iron is the most important material used in manufacturing. Wherever coal and iron ore may be cheaply brought together, the tall chimneys of many factories are seen. Coal is derived from vegetation transformed by heat and pressure into a black or brownish substance occurring in beds or layers. Its varieties are broadly subdivided into hard coal or anthracite, used mainly for domestic purposes;

soft or bituminous coal, the great fuel for steam and coke making; and lignite, which is least valuable as fuel. Coal is very widely distributed over the earth (Fig. 6).

The value of mineral products in the United States is usually more than twice that of the wheat crop. Coal is the most valuable mineral commodity of the country (Fig. 57). The

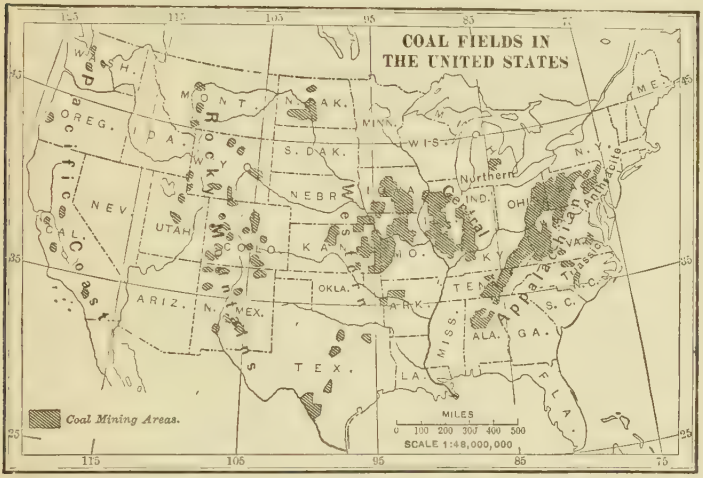

FIG. 57.—Coal underlies more than one sixth of the surface of this country. Bituminous coal is taken from seven great fields: (1) The Appalachian field, extending over 900 miles from New York to Alabama, supplies nearly two thirds of the total; (2) the Central field, in Illinois, Indiana, and Kentucky, supplies nearly one sixth; (3) the Western field, west of the Mississippi, supplies about one ninth; (4) the Rocky Mountain, (5) Pacific coast, (6) Northern (in central Michigan), and (7) Triassic fields (in the Richmond basin, Virginia, and along the Deep and Dan rivers in North Carolina) supply the remainder. The map also shows the anthracite area in the valleys of the Susquehanna, Lehigh, and Schuylkill rivers, covering only 480 square miles in eastern Pennsylvania.

country mines about one third of the world's coal supply, and in 1899 superseded the United Kingdom as the largest producer (Fig. 58). One reason why the United States can sell its iron and steel products abroad is because coal, used in making iron and steel, is so cheaply mined and transported. Machines for mining bituminous coal diminish the

cost and double the production per miner. The average price for hand mining is 50 cents a ton. In the Appalachian field many streams flow in deeply eroded cañons, exposing bituminous coal seams and thus facilitating mining. In the anthracite field, however, deep shafts must usually

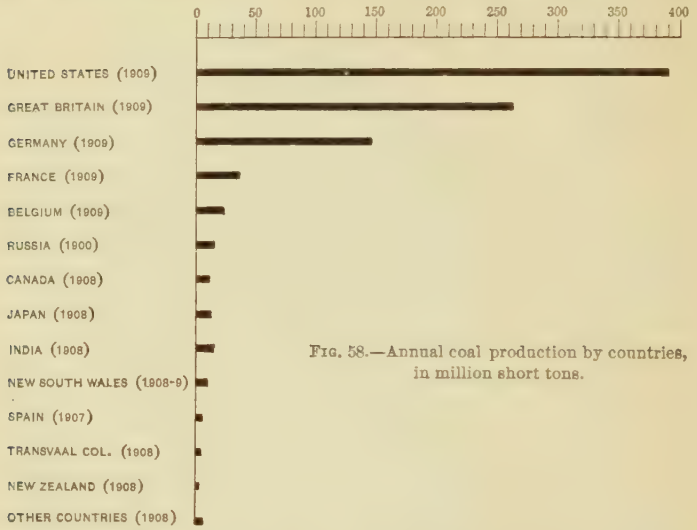

FIG. 58.—Annual coal production by countries, in million short tons.

be sunk to reach the coal beds. On many streams the coal is carried very cheaply on barges to the manufacturing towns, thus supplying power for manufacturing at minimum rates.

Most parts of the country buy bituminous coal from neighboring fields, but anthracite, being almost wholly derived from Pennsylvania, is an important article of commerce as far west as the Missouri river. New York city and neighboring shipping points in New Jersey form the largest coal market in the world except London. Large quantities are sold to steamships. The trade with other countries is small (p. 127) as coal is so heavy and bulky in

proportion to value that it does not pay to sell it in far distant countries except in years of scarcity and high prices abroad, as in 1899, when Europe bought considerable American coal.

Coke is the chief fuel in the metallurgy of iron and steel. It is superior to coal for blast-furnace use, as it gives greater heat and contains little sulphur or other substances harmful in iron smelting. It is produced by heating certain kinds of bituminous coal in ovens from which air is almost wholly excluded. The Connellsville region, forty miles from Pittsburg, produces more coke than any other district in the world. In the southern and central Appalachians are other large centers of coke production. Coke is the fuel used in making nine tenths of United States pig iron; over one third of the coke comes from the Connellsville district.

Coal gas produced from bituminous coal is used for illumination, heating, and cooking. Among the by-products is coal tar, from which benzene is derived; from chemical combinations with benzene come the numerous cheap aniline dyes which have largely supplanted animal and vegetable colors in dyeing and calico printing. Natural gas, often found where petroleum is obtained, is an illuminant and fuel. It is utilized mainly in western Pennsylvania, Ohio, Indiana, Illinois, and Ontario, the western fields supplying the largest quantity. The supply, very abundant at first, falls off after a time.

Petroleum is an illuminant and liquid fuel. The name means rock oil. It is a natural, oily substance, widely distributed in the rocks of many parts of the world (Fig. 7), and usually obtained by boring till the oil reservoir is reached. The United States (Fig. 59) produced, in 1910, over 200,000,000 barrels, which is two-thirds of the world's production. The illuminant kerosene is the chief product of petroleum. Our kerosene goes to most countries of the world, and has a wider sale than any other of our exports. Tank steamers loaded at American refin-

eries pump oil into reservoirs at Bombay, from which the kerosene is, in turn, pumped into tank cars which carry it to all parts of India. Our kerosene is distributed in the same way in many countries. Oil in bulk, formerly excluded from the Suez Canal because explosions or fires were feared, is now freely permitted to pass. Russian kerosene is the

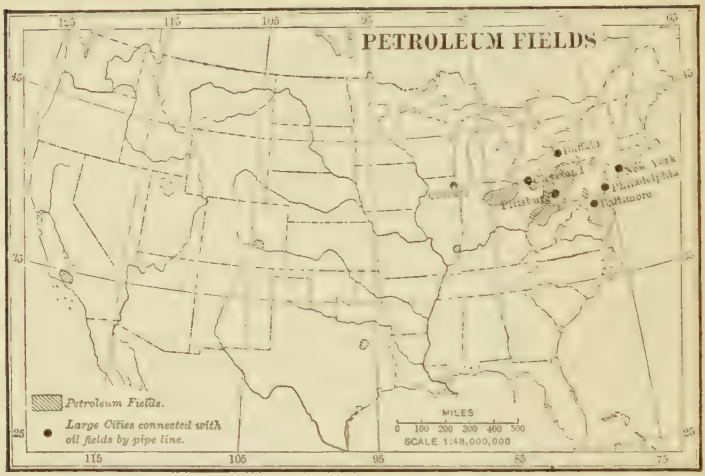

FIG. 59.—The production of crude petroleum in this country in 1903 was 4,219,376,154 gallons. Ohio led, and only six per cent of the total product was outside of the Appalachian and northern Ohio-Indiana fields. The production is decreasing in these fields. Large discoveries have since been made in S. E. Illinois and Southern Texas. The industry began in 1859 at Titusville, Pa. (Fig. 60), and the oil was refined in scores of small refineries around Pittsburg and Oil City. Thousands of miles of pipe lines were then laid from the wells to the seaboard and Great Lakes; refineries were built near New York, Philadelphia, and Baltimore, and near Buffalo and Cleveland. The oil is now pumped directly from the wells to the refineries, whence thousands of tank cars move the manufactured product to the home markets; scores of steamships and sailing-vessels carry oil in bulk or in barrels and cases all over the world. The pipe lines made a saving of over one half in the cost of transport. Economies in production and manufacture have also helped to reduce the price to a very low figure.

largest competitor, but even in Russia much American kerosene is used. Considerable of our crude oil is refined abroad, particularly in France.

The most important of the two hundred by-products of petroleum are lubricating oils, which have largely superseded animal and vegetable oils throughout the world; gasoline, used in making an inflammable gas; and the ointment vaseline.

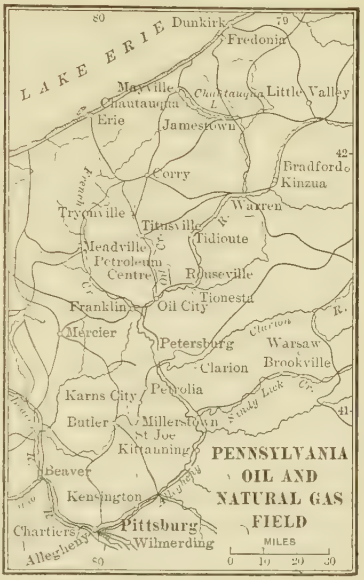

Fig. 60.

Iron is the most widely distributed and useful of metals (Fig. 7). Iron gives a red or yellow color to many soils and to some rivers, as the Congo. Water, percolating through the upper rocks, dissolves the tiny particles of iron. The iron which the water transports is deposited in many places, and thus beds or veins of iron ore are formed. Some of these beds or veins are deep beneath the surface and others are near the surface, so that the ore may be shoveled out of open pits, as in a part of the Lake Superior iron-ore district.

As iron is found pure only in Greenland, it must be extracted from its ores by smelting. The iron thus procured still contains impurities which affect its quality and availability for different purposes. Certain proportions of carbon or sulphur in the metal, for example, render it unsuitable for steel making; impurities may make iron unmalleable or too brittle for many purposes. The most valuable ores are compounds of iron and oxygen, as magnetite, the purest form of iron, or hematite, the best for steel making. The products that result from smelting

these different ores form the various kinds of iron in the market.*

The United States produces nearly half of the world's iron (Fig. 61). While twenty-four states and territories

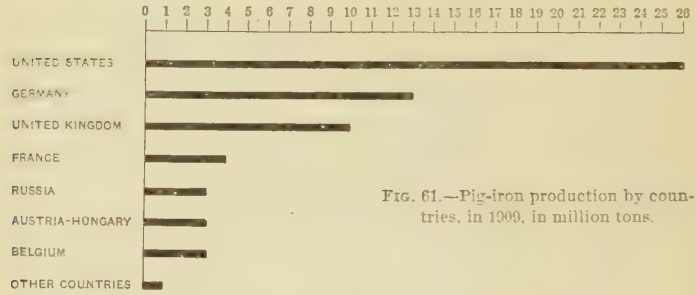

FIG. 61.—Pig-iron production by countries, in 1909, in million tons.

contribute to the iron-ore output, the five iron-ore districts of Lake Superior supply about two thirds of all the ore mined, and the southern Appalachian region, between Maryland and Birmingham, Ala., most of the remainder. The cost of iron ore was reduced one third, in the ten years ending in 1898, by machinery, which cheapened the cost of mining, handling, and transportation. Thus much of the Lake Superior ores (Fig. 62) is shoveled from open pits by steam shovels, which dump the ore into railroad cars, the output of each shovel per day being 1,500 to 2,000 tons, costing from 10 to 50 cents a ton to mine. The cost of underground mining has been reduced to $1 or less a ton. The ore is carried on the cars to the neighboring shipping ports on Lakes Superior and Michigan. It is dumped

* Because iron is a commodity largely used in nearly all industrial enterprises the material condition of a nation is gauged to a great extent by the amount of iron and steel it consumes. The United States and Great Britain, consuming annually about 300 pounds of iron and steel per capita, lead the world. In 1885 the world's consumption was 32 pounds per capita; in South America, 13.5 pounds; Egypt, 7.55; India, 2.4.

into bunkers at the docks, and when the doors are opened slides down chutes into the hatches of the ore ships, many of which carry 6,000 tons of ore. Over 3,000 tons are

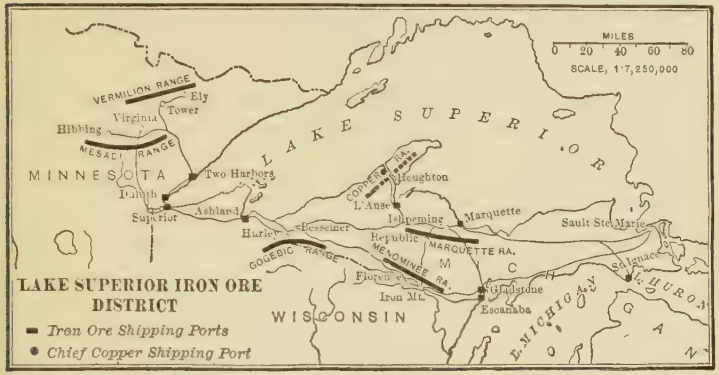

FIG. 62.—At the close of 1898 the Marquette Range had produced 52,000,000 tons of iron ore, more than one third of the total product of the five Lake Superior iron-ore ranges since mining began in that region. Observe the proximity of the mines to water transportation and the railroads connecting them with the shipping ports. Most of the ores adapted for steel making come from these mines. The most important shipping ports are Duluth, Two Harbors, Ashland, Marquette, and Escanaba, which usually ship over 3,000,000 tons each per annum. Observe the Copper Range, which is the second largest source of copper in the country.

loaded in fifty-five minutes. The unloading at the ore-receiving ports (Fig. 63) is very expeditious. Machinery is beginning to supplant hand labor in filling the buckets for landing. Freights, both by lake and rail, are usually very cheap, thus neutralizing the disadvantage of the long distance between the mines and the coke required to smelt the ore. The ore is carried to the coke because it is more convenient and cheaper to build and operate blast furnaces and rolling mills near the great markets for iron and steel.

In the Birmingham, Ala., district, iron ore and the coke-making coal and limestone needed for iron smelting are in juxtaposition (Fig. 64), and thus the cost of iron making is much reduced. The iron ore from Lake Superior and

the Southern states supplies about nine tenths of the pig iron.

Very little iron and steel are imported into the United States. The great advantages this country possesses for cheap mining and manufacturing enable it to supply not only home manufacturers with practically all the iron and steel

FIG. 63. –The map shows the routes through the lakes from the shipping to the receiving ports. As most of the ore is sent to smelters in eastern Ohio and western Pennsylvania, the receiving ports on the south shore of Lake Erie are of largest importance. A railroad between Conneaut and Pittsburg carries nothing but iron ore. Lake Michigan ports, mainly South Chicago and Milwaukee, also receive large quantities of ore. The distance from the mines to Pittsburg, where the larger part of the ore is used, is nearly 1,000 miles; but so economically are all operations conducted that Lake Superior ores are often mined and sold on cars at Lake Erie ports for $2 to $3.50 a ton. The map also indicates the iron-ore and pig-iron output of the chief producing states.

they need, but also to export them in increasing quantities. As most of the iron and steel are made in the East, where it is convenient to bring the iron, coal, and limestone together, so also most of the commodities made of iron and steel are

manufactured in the same region near the largest sources of metal supply. The manufacture of iron and steel products and the trade in them are treated in Chapter XIV.

About two thirds of the Lake Superior ore is smelted at or near Pittsburg, the greatest center of the iron and steel industries; and most of the remainder in the iron-smelting districts of Ohio, notably in the Mahoning Valley, in the Shenango Valley of Pennsylvania, and at South Chicago.

FIG. 64.—Birmingham, Ala., built on the site of a former cotton field, is the largest center of iron and coal mining, blast furnaces, and rolling mills in the South, because it has at its doors large supplies of coal, iron ore, and limestone. Steel works were opened at Ensley in 1899; but few of the ores are Bessemer or steel-making ores; Birmingham ores are used mainly for the manufacture of foundry iron.

The blast furnace in which iron ore is smelted is built as high as one hundred feet or more. It is fed at the top of the shaft with ore, coke, and limestone while a hot blast is driven through the mixture by engines. One and two thirds tons of ore, less than a ton of coke, and a half ton of limestone are used to produce a ton of pig iron. The limestone, melting in the intense heat of the furnace, helps the fusion of the ore and forms a paste with the slag or earthy matter that has been separated from the metal. The molten iron, being heaviest, drops through the mass of limestone and slag to the bottom of the furnace, where it runs off into molds and hardens into pig iron. The best situations for blast furnaces are, of course, where ore, coke, and limestone may most conveniently be brought to them.

Some commodities, such as stoves, are made simply of pig iron melted (cast iron) and run into molds giving it the desired shape. Cast iron is brittle, and a hard blow breaks it; but when pig iron is melted and the molten mass is raked to drive out most of the carbon, the resulting product is wrought or malleable iron, which is rolled out in rolling mills into bars, sheets, and other forms used by manufacturers. Wrought iron is now of less importance than formerly, as steel has taken its place in many manufactures.

Steel is harder, stronger, and more durable than iron, and therefore more useful; and as its cost per ton is less than one sixth its cost in 1858, it has supplanted iron for very many purposes (Fig. 65). Steel-making was very ex-

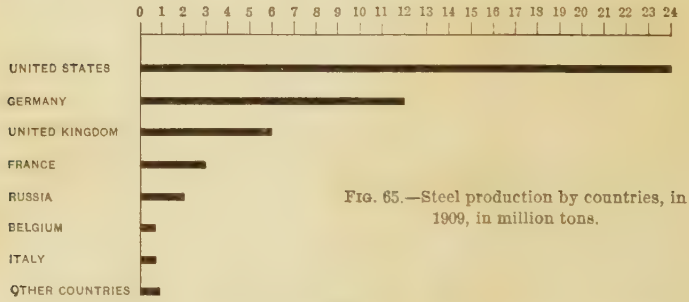

FIG. 65.—Steel production by countries, in 1909, in million tons.

pensive till the late Henry Bessemer, about 1860, proved the success of his method of converting pig iron into steel and revolutionized the iron industry. Bessemer and later inventors devised methods for cheaply burning out most of the carbon in pig iron till the metal becomes steel. As much as five per cent carbon is often present in pig iron, while steel rails usually contain less than one half per cent. Steel has taken the place of iron for nearly all structural purposes, as in ships, boilers, the framework of buildings, and for rails, wire nails, hoops, tin plates, and many other articles.

STEEL INDUSTRY.

CARNEGIE COMPANY. 1. DUQUESNE, PA. 2. MUNHALL, PA. 3. BESSEMER, PA.

Tin is one of the most sparsely distributed metals (Figs. 7 and 66). It is a bright, soft metal, used in many alloys to produce bronzes, britannia metal, and pewter, but its chief use is in coating sheet iron or sheet steel to make tin plate, from which the many utensils known as tinware are made. Since 1891 the United States has made most of its

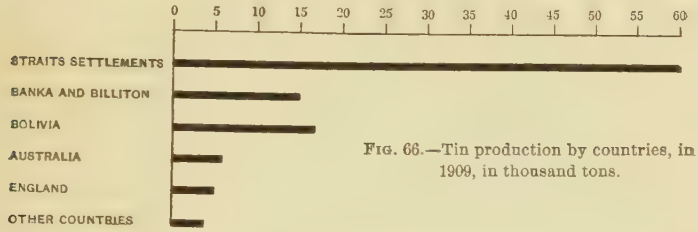

FIG. 66.—Tin production by countries, in 1909, in thousand tons.

tin plate. It is sold for about one fifth less than the price formerly paid for imported tin-plate. Practically all the product of more than three hundred tin-plate mills in the country is consumed at home. The imports of tin amounted to about $9,000,000 in 1898; $21,486,311 in 1904.

FOREIGN COAL TRADE OF THE UNITED STATES

BITUMINOUS COAL IMPORTS (IN MILLION DOLLARS)

	1904.		1904.
From British North America.	3.3	All countries.....	5.0

COAL EXPORTS (IN MILLION DOLLARS)

	1904.		1904.
To British North America...	21.5	To Cuba.....	1.4
Mexico.....	3.1	Total exports (1908).....	1,300,000 tons

PRODUCTION OF PETROLEUM IN 1906 (IN MILLION TONS)

United States.....	16.0	India.....	0.6
Russia.....	8.0	Japan.....	0.8
Sumatra-Java.....	1.4	Germany.....	0.08
Rumania.....	0.9	Other countries.....	0.1
Galicia.....	0.7	Total.....	28.58

United States Exports of Mineral Oil (in Million Dollars) *

	1904.		1904.
To United Kingdom	14.7	To Brazil	2.4
Germany	8.8	Other Asia and Oceania	1.3
France	2.1	Hong-Kong	2.6
Other Europe	12.7	Africa	2.4
Japan	4.9	Argentina	1.9
China	4.7	British North America	2.0
East Indies (British)	2.2	All countries	78.3
British Australasia	2.5	Total exports (1909)	106.0

Iron Ore Mined in 1898 in the United States (in Million Tons)

Lake Superior	14.0
Southern states	5.0
Other states	1.6
Total	20.6
Total iron ore mined in 1909	52.0

Pig-Iron Production in the United States (in Million Tons)

1810.	1864.	1886.	1898.	1900.	1909.
0.05	1	5	11.8	13.8	25.8

Value of Iron and Steel Products in the United States (in Million Dollars)

1880.	1890.	1900.	1905.
296.6	478.7	804.0	928.2

* Kerosene is about six sevenths of the total, and lubricating oils are most of the remainder. Nearly forty per cent of the kerosene produced was exported to foreign markets.

CHAPTER XIII

THE UNITED STATES—(*Continued*)

Precious Metals, Other Metals and Minerals, and the Trade in Them

Copper is, next to silver, the best conductor of heat and electricity. The United States produces more than half of the world's copper supply (Figs. 6 and 67). It is found

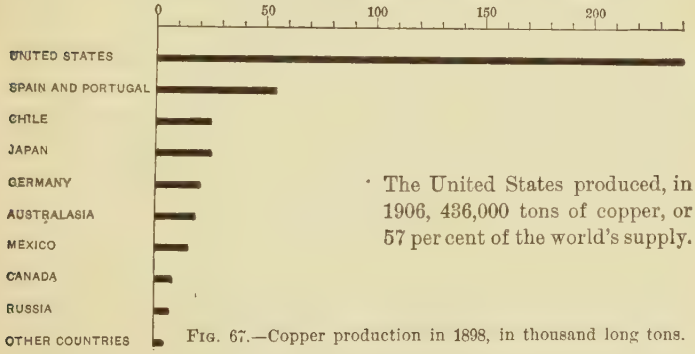

Fig. 67.—Copper production in 1898, in thousand long tons.

pure, as in the Keweenaw peninsula, Lake Superior (Fig. 62), which long supplied all the copper mined in the United States, and is still one of the largest sources of the metal in the world. The pure copper of Lake Superior is distributed through the rocks in sheets or fine particles; this rock is raised to the surface, much of it from great depths, and crushed to get the metal. Most copper, however, is found in the form of ores, as in Montana and Arizona. The mines near Butte and Anaconda, in south-

west Montana, are now the largest sources of copper. All copper ores are difficult to reduce, but such improvements have been made in American processes that the United States now smelts not only its own ores, but also many foreign ores, the resulting copper being shipped back to its owners. The furnaces that smelt the ores of Montana and Arizona often treat over 400 tons of ore a day.

As copper is a fine conductor of electricity and is cheaper than silver, it is the most useful metal in the electrical industries. The new use of electricity to transmit power has greatly increased the demand for the metal. This country uses a large amount of copper in making wire for electrical purposes. A great deal of the metal is also used in sheathing ships and making coins and brass, one of the most useful of alloys. All European countries have to import copper, and the United Kingdom, France, and Germany, in particular, are very large buyers of our copper ingots, bars, and plates ready for manufacturing. Europe takes nearly all the copper we have to sell, which is sometimes half of the output (p. 137).

Brass, an alloy, is one of the most important used in the arts. A large part of the copper output is alloyed with zinc to produce brass, whose acceptable color and the ease with which it is worked make it desirable for fittings in buildings, tubes, machine trimmings, musical instruments, and other purposes. Most of the rolling mills that produce sheet brass ready for manufacturing are in the Naugatuck valley of northwest Connecticut; the factories that make copper wire or turn sheet brass into many products are scattered widely over the Northern states from Boston to Chicago. The value of their manufactures is about $40,000,000 a year.

Bronze, an alloy of copper and tin, is used for bells, statuary, screw propellers, and other purposes.

Gold is one of the few metals that is often found pure. Most of it, however, is alloyed with other metals, chiefly

silver. It occurs in veins, in quartz and other rocks, and is obtained by crushing and smelting the rock (quartz mining). A great deal of gold freed from the rock by water, heat, cold, and other disintegrating influences is mixed with gravel and sand in the beds of streams or on the sea-

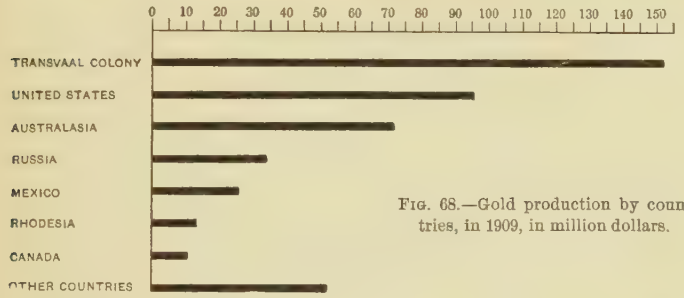

FIG. 68.—Gold production by countries, in 1909, in million dollars.

shore, and is obtained by washing (placer mining). The world's production, rapidly increasing in recent years, was over $400,000,000 in 1909 (Figs. 6 and 68). The United States was long foremost in gold production, but in 1898 the South African Republic attained the first place. Nearly

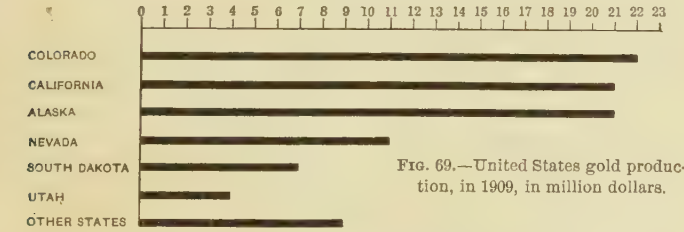

FIG. 69.—United States gold production, in 1909, in million dollars.

all the gold mined in this country comes from Western states and territories, including Alaska (Fig. 69).

The beauty and value of gold make it highly prized for ornamentation. About a fifth of the product, therefore, is annually consumed in the arts, France occupying the first place in this use of the metal, followed by the United

Kingdom and the United States (p. 138). As the metal is too soft to be used pure, it is alloyed with silver or copper. The quantity of alloy added to gold in jewelry is from 12 to over 50 per cent. Pure gold is called 24 carats fine. When there are equal parts of gold and alloy the mixture is 12 carats fine.

Most of the gold output is coined. It is the standard money of many nations. Its great advantage as money is that usually it can not be obtained without great labor, and that it fluctuates little in value. The average output per miner does not often exceed $6 to $12 a week, and, counting wages and cost of machinery, a dollar is believed to be expended for each dollar's worth of gold produced. Many mines are very profitable, but we hear little of the large sums expended in unprofitable mining.

Silver is found in ores combined with lead, sulphur, or other elements (Fig. 6). All civilized nations use it for small coins, and it is the monetary standard in many countries. Silver also is very largely used in the arts (p. 138). Its price has been declining for thirty years (p. 138). Because the value of gold is nearly constant, while that of

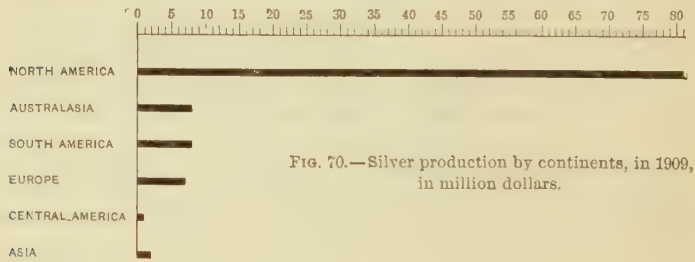

FIG. 70.—Silver production by continents, in 1909, in million dollars.

silver is subject to fluctuations, gold is a more reliable standard of values. Our Western states and territories, to which silver mining in this country is confined, make the United States first in silver production (Figs. 70 and 71).

All large trading countries send gold or silver coin or bullion to foreign lands to settle trade balances. Thus the imports of coin and bullion in the United States exceed

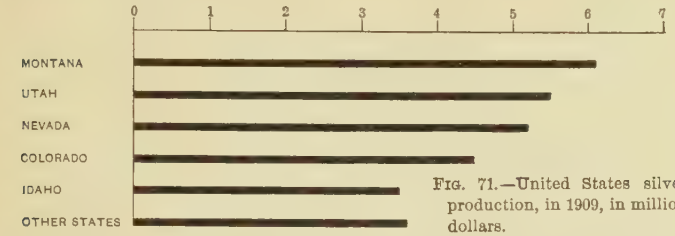

FIG. 71.—United States silver production, in 1909, in million dollars.

the exports partly because this country sells more commodities to many foreign lands than it buys from them.

Manufactures of jewelry and other wares made of gold and silver are large industries in the United States. They are mainly situated in the East. Providence, R. I., leads in the production of jewelry. Some Western cities, as Chicago, Cincinnati, and San Francisco, have become prominent in gold and silver products. The watches made in Massachusetts, Illinois, and New Jersey have cut off most of the imports from Switzerland. Silver plating, a larger industry than jewelry manufacture, is mainly centered in Connecticut. Electro-metallurgy has greatly reduced the cost of plating, so that plated ware is now within the reach of a larger public than formerly.

The export of gold and silver manufactures is small, but in prosperous times the imports are very large, most of the jewelry coming from France.

The diamond is, except the finest rubies, the most costly of precious stones. South Africa and Brazil are now the only sources of diamonds (Fig. 7). Nearly all the world's supply since 1867 has been received from the Kimberley mines, Cape Colony, where the yearly output is sold in March to London buyers, who sell most of the rough stones to Belgian and Amsterdam cutters. Several million dollars

worth of uncut diamonds are imported into this country every year. The value of the cut diamond imports is about twice that of the rough stones, which are on the free list. The black diamond, mined only in Brazil, is used in diamond drills and for other abrasive purposes.*

Zinc is a hard metal, most used in making brass and coating iron (galvanized iron) and copper for protective purposes. The largest source of home supply is in the Galena-Joplin district of Kansas and Missouri, which furnishes about half the output (p. 138). When zinc is subjected to intense heat a powder, called zinc white, is produced, which is used as a basis for paints. The production of the United States has about doubled since 1897.†

Aluminium forms about one fifteenth of the crust of the earth. The difficulty of extracting it from its various compounds made it too costly for general use until recent years. The price has been reduced from $8 a pound in

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* Among other precious stones is the ruby, of which Burma is the main source of supply. The only turquoise mines on a large scale are near Nishapur, Persia. Emeralds are found in the Ural Mountains, in South America, and in some other regions. This country imports nearly all the precious stones in the jewelry trade. Most of the turquoise, tourmaline, sapphire, and opals mined here find their way into mineral cabinets.

† Salt is produced in most parts of the world (p. 138). It is used as a condiment, as a preservative of foods and hides, and in the manufacture of soda, glass, and other articles. On the coasts of warm countries sea water is evaporated in shallow tanks under the sun's rays, and in colder countries artificial heat is used to produce sea salt. In many regions brine springs are tapped by boring, the brine is artificially evaporated, and most of the product is known as common salt. Mines in Austria-Hungary, England, and some other lands yield masses of solid or rock salt. The United States produces sea salt from lagoons in Massachusetts and California, and rock salt in several states; but most of the product of this country is common salt obtained from brine wells (p. 138). As salt is so widely distributed it is not an article of large international commerce. This country neither imports nor exports important quantities.

1888 to 35 cents a pound, and the strength, malleability, and lightness of this silver-white metal has led to its use for many purposes. It is replacing copper to some extent as an electrical conductor, and is used in many articles in the place of wood, iron, brass, and zinc. This country produces half of the world's output and exports a small amount. The production in 1908 was 11,152,000 pounds.

Sulphur is found mainly in volcanic regions. Most of the supply comes from Sicily and South Italy. Refined sulphur is the brimstone of commerce. It is used in the manufacture of gunpowder, in medicine, and for vulcanizing rubber. One of its most important uses is in the production of sulphuric acid or oil of vitriol, the most important of all chemicals. Sulphuric acid is an essential agent in the manufacture of many of the most common and useful articles, such as glass, aniline colors, phosphorus, from which matches are made, and kerosene. Few materials more largely enhance the comfort and luxury of life than sulphuric acid. Sulphur is mined in Utah, Nevada, and Louisiana, but the total product is comparatively small (p. 138) and the imports from Italy (duty free) are consequently large.

Lead enters largely into the trade of the United States. It is a very soft metal, used for roofing, water pipes, and other purposes, and is produced most largely in the silver-mining regions of the United States, where it is combined with silver ores. This country and the United Kingdom consume four sevenths of the world's supply, our imports coming almost wholly from Mexico; Spain, the second largest producer, sends nearly all her product to England. The most important preparation of the metal is white lead, used as a basis for colors, and thus a valuable ingredient in paints. White lead is manufactured in many of our larger cities.*

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* Pewter is an alloy of tin and lead, used in cheap table ware. Mercury or quicksilver is used in extracting gold and in the manufac-

Phosphate rock is used as a fertilizer. Florida, South Carolina, and Tennessee produce 1,000,000 tons a year, half of the world's supply. A third of the product, mostly from Florida, is shipped to Europe, Germany being the largest buyer. Nitrate of soda, largely imported from Chile to Europe as a fertilizer, is used to much less extent in the United States.

Limestone, granite, sandstone, and slate are the most useful varieties of stone. Stone quarrying is one of the large industries of this country. Limestone is quarried in most parts of the United States, and its varieties are used for

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ture of looking glasses, thermometers, and a few other articles. The quicksilver mines of California supply the home demand, and a considerable quantity is exported (p. 138). Manganese, closely resembling iron, is valued as an alloy in the production of some kinds of steel. The Southern states mine one fifth of the manganese used, and Russia, Brazil, Cuba, and some other countries send about $600,000 worth a year. Nickel is alloyed with other metals in making small coins, with copper to produce German silver, and with steel in the manufacture of armor plate. New Caledonia produces more than half of the world's supply and Canada most of the remainder. The nickel used in the United States comes from the Sudbury mines in Canada. Cobalt, mined in New Caledonia, Australia, and Germany, is used in the arts, chiefly in the form of an oxide, to produce a vivid blue color that is not affected by atmospheric changes, and is employed in painting, printing bank bills, and decorating glass and porcelain. Much of the ore, carried as ballast to London by ships laden with wool from Australia, is smelted in Europe and this country. Graphite, or plumbago, a form of carbon used for lead pencils and other purposes, is mainly derived from Ceylon, which supplies this country with most of its imports. The smaller domestic supply comes chiefly from Ticonderoga, N. Y. Factories in New York and Jersey City turn out nearly 1,000,000 lead pencils a day. They are sold all over the world and supply most of the home demand. Platinum is specially valuable for chemical apparatus, because it is not injured by acids. The mines in the Ural Mountains supply only about 4,000 to 12,000 pounds a year. Saltpeter, one of the ingredients of gunpowder, comes mainly from northern India, and small quantities are mined in the United States and Colombia. Platinum was worth $258 a pound in 1908.

many purposes, such as structural materials, a flux for smelting iron, lead and copper ores, and the making of lime and cement. Marble, produced mainly in Vermont, is used for monuments and building material. The New England states produce more than half of the granite which is used for buildings, bridge work, and other structural purposes. Most of the sandstone, including the brown stone much used in Eastern cities for house fronts, is quarried in Ohio, New York, Pennsylvania, and Connecticut. The only American stone that is exported to any considerable extent is slate, used mainly for roofing purposes, and produced in largest quantities in the North Atlantic states.

Clay products are among the largest mineral industries. Over 8,000 establishments making brick, sewer pipe, drain tile, stone ware, and other articles are scattered through every part of the Union, and the value of their output, surpassed only by the value of coal and iron, amounted in 1899 to over $95,000,000. The clay known as kaolin is used in paper making to give weight and a good surface for printing, and also in the manufacture of china ware. The largest pottery manufactures are at Trenton, N. J., and at East Liverpool, Ohio; these markets regulate the prices in this country for china clays. Thirty factories in Trenton make both white and decorated wares. Our china products have scarcely begun to seek foreign markets, and a large amount of foreign stone and china ware is still imported.

United States Copper Output in 1909 (in Million Pounds)

Montana.	Michigan.	Arizona.	Utah.	Nevada.	Total.
314	227	292	100	52	1,092

Exports of United States copper and its manufactures in 1909, $85,000,000.

	1864.	1874.	1908.
Price of copper per pound in cents.....	55	25	13

ANNUAL CONSUMPTION OF GOLD IN THE ARTS (IN THOUSAND POUNDS AVOIRDUPOIS)

France.	United Kingdom.	United States.	Germany.	Switzerland.	Italy.	Russia.	Belgium and Holland.	Austria-Hungary
35.2	34.1	30.8	29.0	18.9	11.0	9.0	6.8	6.2

ANNUAL CONSUMPTION OF SILVER IN THE ARTS (IN THOUSAND POUNDS AVOIRDUPOIS)

United States.	Germany.	France.	England.	Russia.
555	330	330	308	209

	1871.	1881.	1891.	1896.	1898.
Average value of bar silver per ounce in dollars (gold)	1.32	1.13	0.98	0.67	0.59

ZINC PRODUCTION IN 1897 (IN THOUSAND METRIC TONS)

Germany.	Belgium.	United States.	France.	Total.
151	116	104	24	468

Zinc production in the United States in 1908 was 190,749 tons.

SALT PRODUCTION IN 1897 (IN MILLION SHORT TONS)

United States.	United Kingdom.	Russia.	Germany.	France.	India.	Spain.	Austria-Hungary.	Total.
2.2	2.1	1.7	1.3	1.1	1	0.6	0.6	11.2

UNITED STATES SALT PRODUCTION IN 1898 (IN MILLION BARRELS)

New York.	Michigan.	Kansas.	Ohio.	California.	Total.
6.8	5.3	1.9	0.7	0.7	17.6

Salt production in the United States in 1908 was 28,822,060 barrels.

SULPHUR PRODUCTION IN 1897 (IN THOUSAND METRIC TONS)

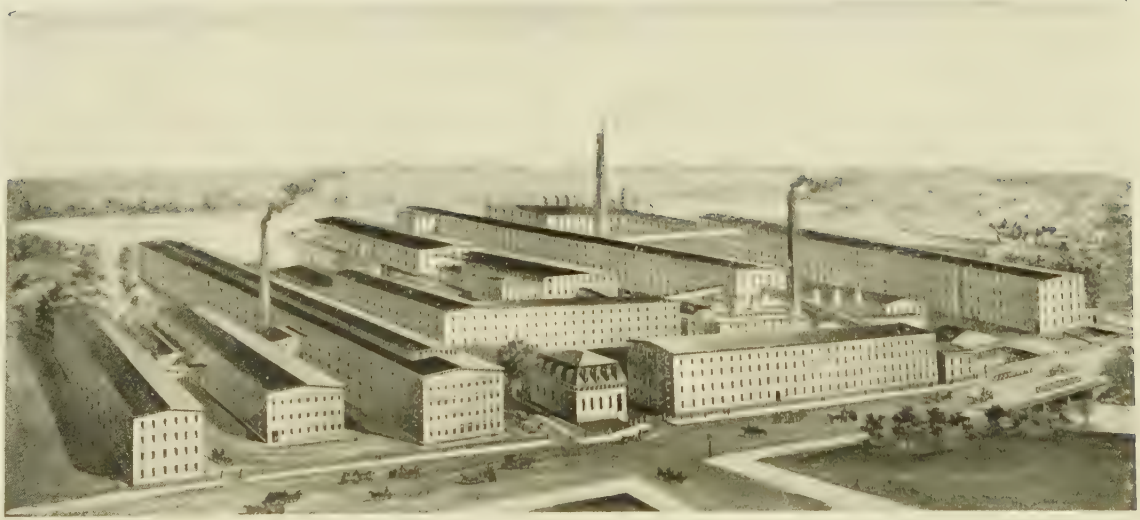
Italy.	Japan.	Spain.	United States (1898).
497	12.5	3.5	2.7

Sulphur production in the United States in 1908 was 369,444 tons.

QUICKSILVER PRODUCTION IN 1898 (IN METRIC TONS)

Spain.	United States.	Austria.	Mexico.	Russia.	Total.
1,681	1,058	494	353	362	3,948

Quicksilver production in the United States in 1908 was 19,752 flasks.



MANUFACTURING INDUSTRIES.

WORSTED MILLS, PROVIDENCE, R. I.

CHAPTER XIV

THE UNITED STATES (*Continued*)

DISTRIBUTION OF MANUFACTURES — CONDITIONS THAT FAVOR MANUFACTURING DEVELOPMENT—MACHINERY, LEATHER, BOOTS AND SHOES, CLOTHING, GLASS, ETC.

The United States holds the first place as a manufacturing nation. In the last years of the nineteenth century the production of manufactures in the United States was nearly double that of the United Kingdom. About nine tenths of the country's manufactures are consumed at home, and yet a vast quantity of foreign manufactures is also imported. The value of the home market has been much enhanced by the fact that the people of the United States spend more *per càpita* for necessaries and luxuries than any other nation (p. 147). Large manufacturing development indicates the greatest material prosperity, as the percentage of profit is much greater on manufactures than on raw substances. The French, for example, turn raw materials from other lands into many tasteful and pleasing articles, and make a much larger profit on them than on the substances themselves.

Various causes influence the distribution of manufacturing. Mills and factories are usually found wherever raw material and good markets are easily accessible; the flour industry, for instance, has steadily moved westward to the Great Lakes and to the Mississippi Valley, till its great center is now Minneapolis, on the threshold of the hard-wheat region.

The early manufactures of America, such as hand spinning, weaving, blacksmithing, ship and house building, developed along the seacoast where the colonists had their homes. The people planted settlements inland along waterways, built towns on the banks of the Erie Canal, fringed the lake shores with their homes, and finally spread railroads and telegraphs over the land. These lines of penetration became the pathways along which manufacturing industries advanced.

Water power played a very important part in distributing manufactures before steam was used. It gave industrial pre-eminence to New England, and made manufacturing towns of Trenton, Philadelphia, Richmond, Columbia, Augusta, and many other places. A great future is opening to water power in the electrical transmission of its motive force. Thus water power eighty miles from Los Angeles is now utilized in that city. Only a small part of the country's vast water power is as yet used.

Some industries are situated near others that use most of their product. Thus the chemical industries of the United States are situated, to a large extent, near the textile manufacturing centers, dyeing and bleaching works, oil refineries, fertilizer factories, etc., that are the main markets for their products.

The principal industrial regions, on the whole, are those that are most thickly populated (Fig. 31). Manufacturing is therefore most prominent in the northeast, the states of New York, Pennsylvania, New Jersey, and New England producing more than half the manufactures of the country. Maryland, Illinois, Ohio, Michigan, and Indiana follow. The Southern states and those beyond the Mississippi are also developing many industries. With their advantages in the cheapness of labor and fuel, the Southern states have, in the last few years, invested $1,000,000,000 in factories and machinery. Their cotton, iron, and steel industries have been greatly developed.

As population grows the variety of manufactures increases. Twenty-five years ago the manufactures of the Western states were mainly for hard usage and everyday utility, but Western factories now serve the refinements and luxuries as well as the utilities of life. In 1875 piano-making was limited to New York, Boston, Baltimore, and Philadelphia, but in 1894 Chicago had taken the third place in the number of pianos produced, and Buffalo, Rochester, Cincinnati, and other interior cities were prominent in this line. In 1860 no Western city manufactured jewelry to any extent, but in 1894 San Francisco held the fifth, Cincinnati the seventh, and Chicago the eighth place in these manufactures. Three of the eight large watch-manufacturing companies are in Illinois.

The conditions that have favored manufacturing development in the United States are (1) abundance of raw material and fuel, (2) enormous capital, (3) great inventive talent, which has devised a large variety of labor-saving machinery and applied scientific discoveries to many processes of manufacture, (4) the intrinsic value of the products and the promptness with which orders are filled, and (5) a protective system that has fostered many industries by excluding quantities of foreign commodities. Other factors also, such as the reduced cost of many raw materials, the decreased rate of interest on money, and low freight rates have helped the United States manufacturers to compete with the products of cheap labor in foreign markets.

Iron and steel articles are made most largely in the States that produce the most pig iron. Nearly all the structural shapes of steel used for bridges, frames for buildings, etc., come from Pennsylvania. That state also produces more than one half of all the rolled iron and steel, while Allegheny County, Pa., in which Pittsburg is situated, makes more than one fourth of all the product, such as rails, iron and steel plates for cut nails, spikes, and wire rods. These

products are made in rolling mills, where the metal, usually heated, is passed through rollers that give it either its final shape or the form required for purposes of further manufacture.

A large variety of articles, as stove parts, etc., is made in foundries by pouring molten cast iron or steel into molds. Foundries and shops for making machinery are widely scattered over the Northern states. Philadelphia, Chicago, and New York city lead in supplying foundry products and machinery; Pittsburg, Providence, St. Louis, Cincinnati, Cleveland, Buffalo, Worcester, Mass., and Erie, Pa., are also conspicuous for these industries.

American nails, wire, saws, tools, locks, hinges, and many other articles are sent all over the world. Imports of hardware, except cutlery, have nearly ceased, owing to the excellence and cheapness of the domestic products.

Among the great iron and steel industries is the manufacture of locomotives. Twenty-eight plants in Philadelphia, Paterson, N. J., Schenectady and Dunkirk, N. Y., Pittsburg, Providence, Richmond, Scranton, Pa., Manchester, N. H., and elsewhere make 3,000 engines a year. As the average life of a machine is twenty years, and the average annual domestic demand does not much exceed 1,800 engines, there is opportunity to fill foreign orders. American locomotives are now sold in the United Kingdom, Siberia, Sweden, France, and some other countries. The trade is growing every year, and in 1898 about one fourth of these manufactures was sold abroad.

The value of machines produced in the United States is about $500,000,000 a year. No other nation has so far supplanted hand labor by machinery as the United States. In the manufacture of machinery two distinct features, perfected in America, are (1) the production of interchangeable parts applied to a large number of products, such as sewing machines, bicycles, firearms, watches, and others; and (2) automatic machines which take the mate-

rial and, without manipulation, turn out the finished article, such as twine, yarn, pins, pens, and many other products or parts of them.

About one fourth of the value of all the machinery produced is in agricultural machinery and implements (p. 147). Seeders, steam and other plows, self-binding reapers, mowers, farm windmills, ditchers, and many other machines are manufactured extensively in the Mississippi Valley, the lake region, and western New York, where the farming interests are largest. Agricultural machinery exports have almost wholly developed since 1865, and are still rapidly growing. The leading countries of Europe, Argentina, Canada, and British Australasia take nearly all the exports, over two thirds of which are mowers and reapers, with plows and cultivators as the next largest items (p. 147).

American sewing machines compete successfully in all the world's markets. About 8,000 patents were issued in the United States between 1842 and 1898 on sewing machines alone. More than sixty companies are engaged in this industry, and American manufactories have even been established in foreign lands. The value of the exported product is over $4,000,000 a year.

Shipbuilding, after the civil war, languished, and the United States depended upon other nations for its ocean carriage. But the cheapening of iron and steel and the excellence of American steel ship plates, marine boilers and engines, all of which are bought to some extent by foreign shipbuilders, have helped to revive the home industry. Armor plate, not made in this country before 1890, is now supplied to many war ships. The largest shipbuilding plants are at Philadelphia, Sparrow's Point, Md., Richmond, San Francisco, Newport News, and Bath, Me. The first American steel sailing ship was built at Bath in 1898.

Other large manufactures are car building, including ordinary passenger, sleeping, freight, and refrigerator cars for railroad lines and cars for street service.

The cooperage industry has an annual production worth about $50,000,000. Barrels used for flour and sugar are of elm; casks are usually made of oak. The fact that these articles are easily handled makes them very popular both in America and in Europe for the transport of many products. The staves are made at lumber mills, and shipped to cooper shops all over the country. Staves and heads worth several million dollars are annually sent to foreign countries.

None of the chief leather-producing countries has enough raw material at home to supply the demand. Europe imports about 18,000,000 pounds a year of raw hides from South America, India, Australia, and other countries in addition to its own large supplies and the quantities of finished leather it buys from the United States. This country's imports of hides have nearly doubled in five years (p. 147), as the millions of cattle killed in the United States supply only a part of the hides required by the leather trade. Argentina, Uruguay, and Brazil are the largest sources of foreign hides, but a great many come from Europe and Mexico. The method of tanning by the use of chromium compounds, discovered in 1856, and applied in Philadelphia, soon made that city the largest leather manufactory in the world.

The United States leads the world in the production of leather footwear. About two thirds of the boots and shoes made in this country come from the New England states. Custom-made boots and shoes are produced all over the country, but most of the product is factory made, and the output is valued at over $320,000,000 a year. New York, Rochester, and other cities in New York state, Philadelphia, and Chicago are prominent in this industry. Cincinnati and St. Louis turn out great quantities of women's shoes, but Lynn, Brockton, and Haverhill, in eastern Massachusetts, are the leaders, and Massachusetts has over half the factories and turns out more than half the product

(p. 148). Machinery has revolutionized the industry. Machines have replaced the lapstone and the hammer. They split and cut leather into strips for sole leather, do the sewing and pegging, make the heels, and save hand labor in other ways. One man sews the soles of 500 to 600 pairs of shoes in a day. American shoe factories can produce in eight or ten months a year's supply for the home market. Boston handles nearly all the New England goods, and is the largest market in the country.

Boot and shoe exports have been small for many years, considering the enormous production. This was due to the rise in the price of materials, to the large home demand, and to the failure of manufacturers to adapt their styles to the wants of countries which import footwear. The United Kingdom exports far more boots and shoes than the United States, most of them going to her colonies. In the past few years there has been renewed interest in the export trade, which is now rapidly growing (p. 148).

The production of ready-made clothing for men and boys is valued at about $330,000,000 a year. The quality of ready-made clothing has greatly improved, and as a result much less than one third of the clothing worn by men in the United States is custom made. The manufacture is widely distributed in all the larger cities, New York being the greatest center, followed by Philadelphia, Chicago, Cincinnati, Boston, Baltimore, and Rochester. The goods are made in homes or small shops, which work up the output of the domestic cloth mills, while most of the imported cloths are consumed in the custom trade. Imports of cotton, wool, and silk clothing, including knit goods, are less than $5,000,000 a year.

Canning is an enormous industry. The value of the stuffs thus prepared in the United States is over $80,000,000 a year. Illinois, Iowa, and Kansas—all large corn states—divide corn canning with Maine, New York, and Maryland.

Peach canning is mainly confined to the large peach-growing sections of Maryland, New York, Delaware, and Michigan. Salmon is canned only on the Pacific coast, with Alaska as the chief source of supply. Most of the milk canneries are in the dairy states of New York, Ohio, and Illinois. The large and small fruits, with tomatoes, beans, peas, and pumpkins, are extensively canned; also corned beef, at the large slaughtering centers, and sardines and lobsters on the Maine coast. The variety of canned goods is constantly increasing, and now includes soups, minced meat, brown bread, and other articles. The exports of canned fruit, meats, and vegetables are large.

The production of glass in the United States is over $60,000,000 a year (p. 148). Nearly every part of the country has sand adapted for glassmaking, and the industry is carried on in about twenty-five states, but Pennsylvania produces two fifths of the entire output, and Indiana, New York, Illinois, Maryland, Missouri, and West Virginia are the next largest producers.

Connecticut is the great clockmaking state. There are large factories in New Haven, Waterbury, Thomaston, Ansonia, Bristol, Winsted, and Forestville, in that state, and also in New York city and Boston. There are perhaps not more than thirty clock companies in the country, but they supply the demand and export about $1,000,000 worth a year. The imports, confined chiefly to French clocks, are about one third the exports.

In the enumeration of the manufactures in this and previous chapters it has not been possible even to mention many important industries. The aim has been to include a sufficiently large number to give an idea of the enormous development and variety of industrial activities in the United States.

MANUFACTURING IN THE UNITED STATES (IN MILLION DOLLARS)

Year.	Capital.	Salaries and wages.	Raw material.	Gross product.	Net product.*
1850.....	533	237	555	1,019	464
1880.....	2,780	948	3,397	5,370	1,973
1890.....	6,525	2,282	5,159	9,372	4,211
1900.....	9,875	2,735	7,361	13,040	8,388 †

NUMBER OF PERSONS EMPLOYED IN MANUFACTURING (IN THOUSANDS)

1850.	1860.	1870.	1880.	1890.	1900.
957	1,311	2,055	2,739	4,712	5,718

LEADING MANUFACTURES IN 1900 (IN MILLION DOLLARS)

Iron and steel..	836	Leather.....	204	Clay products.....	95
Meat industries.	587	Dairy products	131	Gas	75
Lumber.....	567	Paper and wood pulp	127	Glass.....	57
Flour	561	Kerosene	124	Ships, iron and steel	50
Smelting, etc...	358	Wagons, etc.....	122	Carpets.....	48
Cottons.....	339	Woolen goods	120	Dyeing, etc.....	45
Boots and shoes.	261	Worsted goods	119	Cordage and twine.	38
Malt liquors ...	237	Silks.....	107	Coke	36
Printing.....	223	Farm implements..	101	Ships, etc., wood...	24
Cars, etc.....	218	Distilled liquors ...	97	Naval stores.....	26
Chemicals, etc..	203	Hosiery, etc.....	95	Sugar, etc., beet...	7

EXPORTS OF AGRICULTURAL IMPLEMENTS IN 1899 (IN MILLION DOLLARS)

To France.	Germany.	United Kingdom.	Other Europe.	Argentina.	British N. America.	British Australasia.	All countries.
1.8	1.7	1.4	2.7	2.0	1.8	0.9	13.6

IMPORTS OF RAW HIDES AND SKINS (IN MILLION DOLLARS)

1895.	1898.	1899.	1902.	1909.
26	40	51	58	52

EXPORTS OF SOLE LEATHER

Exports of sole leather grew from $12,000,000 in 1891 to $28,000,000 in 1905.

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* The net product is the value less the cost of raw material.

† The net product is the intrinsic addition made to the wealth of the country by manufacturing operations.

Product of Leading Boot and Shoe Centers in 1905 (in Million Dollars)

Brockton, Mass.. 30.0	New York City.. 11.9	Manchester, N. H. 6.6
Lynn, Mass..... 25.9	Cincinnati, O... 10.5	Chicago, Ill..... 5.5
St. Louis, Mo... 19.1	Rochester, N. Y. 8.6	Boston, Mass..... 5.6
Haverhill, Mass. 15.2	Marlboro, Mass. 6.6	Columbus, O..... 5.4

Boston Boot and Shoe Shipments to the West and South (in Million Dollars)

1870.	1880.	1890.	1892.
1.2	2.2	3.5	3.7

Exports of Boots and Shoes (in Million Dollars)

1865.	1876.	1890.	1894.	1898.	1905.
2.0	0.4	0.7	0.8	1.9	8.1

Glass Product in 1900 (in Million Dollars)

Flint.	Window.	Green and black.	Plate.
20	10	9	7

Manufactures by States, etc., in 1900 (in Million Dollars)

1. New York..... 2,175	19. Nebraska 144	36. Oregon 46
2. Pennsylvania.... 1,835	20. Virginia..... 133	37. Delaware 45.3
3. Illinois..... 1,266	21. Maine..... 127	38. Arkansas 45.2
4. Massachusetts... 1,035	22. Louisiana..... 121	39. Mississippi 40
5. Ohio..... 832	23. Texas..... 119	40. Florida..... 37
6. New Jersey..... 611	24. New Hampshire. 118.6	41. Hawaii 25
7. Missouri..... 385	25. Tennessee 107	42. Arizona..... 21.3
8. Indiana..... 378	26. Georgia..... 106.6	43. Utah..... 21.2
9. Wisconsin..... 361	27. Colorado..... 103	44. South Dakota.... 12
10. Michigan..... 357	28. North Carolina.. 95	45. North Dakota.... 9
11. Connecticut..... 353	29. Washington..... 87	46. Oklahoma..... 7
12. California 303	30. Alabama 81	47. New Mexico..... 5.6
13. Minnesota..... 263	31. West Virginia... 75	48. Wyoming..... 4.3
14. Maryland..... 243	32. South Carolina . 59	49. Alaska..... 4.2
15. Rhode Island.... 184	33. Vermont..... 58	50. Idaho 4
16. Kansas..... 172	34. Montana..... 57	51. Indian Territory. 3.8
17. Iowa 165	35. Dist. of Columbia 48	52. Nevada..... 1.6
18. Kentucky 155		

CHAPTER XV

THE UNITED STATES (*Continued*)

FREIGHT RATES—RIVERS—RIVER PORTS—THE GREAT LAKES—THE "SOO" CANAL—LAKE PORTS—CANALS—RAILROADS—COASTING TRADE—NEARBY FOREIGN SEA TRADE—DEEP-SEA TRADE—SEAPORTS

Freight rates in the United States have declined continuously for thirty years. One reason why the United States can send agricultural and meat products 1,200 miles to the seacoast and sell them to food-buying nations in competition with countries like Russia, Argentina, and the Australian colonies, whose export supplies are raised not far from the sea, is that its inland transportation is enormously developed and freight charges are the lowest in the world, except some long distance ocean freights. The average rates per ton mile (the price per ton for a mile of carriage) on the trunk railroads declined from about two cents to six mills, and on two of them to 3.6 mills (p. 161). Average rates on the New York canals declined from 6.5 mills per ton mile to 1.9 mills; the present average canal rates are one third that of most railroads. The average cost on the Great Lakes is about six tenths mill per ton mile. The cost on the largest ocean freighters averages about a half mill per ton mile.

The United States carefully fosters its rivers (Fig. 72). Both Federal and state Governments assiduously endeavor to increase their efficiency for commerce. The River and Harbor bill is introduced in Congress every year

FIG. 72.—On the basis of three feet as the minimum depth of navigability, the rivers afford over 14,000 miles of navigation, measured in straight lines, and much more following the sinuosities of the streams.

to provide funds for the improvement of navigation, and the expenditure is very large.

The Mississippi and its tributaries supply about two thirds of the river navigation, or more than 9,000 miles. On the Pacific coast the Columbia is navigable for 500 miles, the Willamette for 125 miles, the Sacramento for 150 miles, and its branch, the San Joaquin, for 100 miles. The Hudson, which floats large ocean ships 100 miles from its mouth, has a freight tonnage of over 10,000,000 tons a year. The Delaware carries over 20,000,000 tons a year, mainly ocean freight. The Ohio and its tributaries carry over 15,000,000 tons a year, mainly coal, grain, lumber, and the iron and steel and other products of the mills and potteries on their banks. About the same amount of freight is carried on the Mississippi. In 1890 11,000,000 passengers were carried on the rivers of the Mississippi system, and on many rivers, notably the Hudson, the passenger traffic is a large element in the total transportation.*

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* St. Louis, the largest river port in the country, is the commercial center of the Mississippi Valley and commands more of the Mexican trade than any other city. Cincinnati is the chief port of the Ohio Valley. Pig iron, steel, coal, and lumber are transported by river at very cheap rates to its many factories. The situation of Pittsburg at the junction of the two rivers which form the Ohio, together with the development of coal, iron, and natural gas industries, gave the city its manufacturing and commercial importance. Louisville, on the Ohio, with fine facilities for receiving raw materials, has large iron pipe, wagon, flour, leather, tobacco, and other industries. The proximity of Kansas City to large stock- and grain-raising regions has made it, next to Chicago, the greatest live stock market in the world. Slaughtering and meat packing are its main industries, and its Southern trade is very important. St. Paul became a city because it is at the head of navigation on the Mississippi. It is a large railroad, jobbing, and manufacturing center. The Falls of St. Anthony made Minneapolis known as a flour- and lumber-making town before it contained 500 houses. Its flour, wood-working, and machinery industries have had phenomenal development. Memphis, at the head of navigation for the larger vessels on the Mississippi, is the chief commercial point between

The Great Lakes are the most important feature of internal navigation. They provide, with the "Soo" and Canadian canals at the rapids in the St. Mary's River, the St. Clair and Detroit Rivers, and the Welland Canal, an unbroken stretch of navigation from Duluth to the foot of Lake Ontario, over 1,000 miles. The freight movement on the lakes is the largest feature of internal water transportation, because the heads of the lake system (Lakes Superior and Michigan) are near the largest sources of iron ore, copper, including that from Montana, wheat, flour, and lumber. For these reasons the ton mileage on the lakes is equal to nearly forty per cent of that of all the railroads in the country. Some of the largest lake vessels carry 250,000 bushels of wheat at a load. More than five times as many vessels pass through the Soo and Canadian canals (Fig. 73) every year as through the Suez Canal.

FIG. 73.—THE SOO AND CANADIAN CANALS.
The Soo Canal carries nine tenths of the freight and most of the passenger business; its freight tonnage in 1909 (over 57,000,000 tons) was more than seven times that of 1889.

Superior and Duluth are the main points of concentration and distribution of the Lake Superior traffic. Chicago, Milwaukee, Detroit, Toledo, Cleveland, and Buffalo are the main points of concentration and distribution on the other lakes. Superior has large coal docks and ship yards and many manufacturing interests, mainly flour and lumber. It is near Duluth, whose business interests are similar, and both cities ship large quantities of wheat, flour, sheep, wool, hides, copper and iron ores. They are the

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St. Louis and New Orleans. Vicksburg is a large cotton market and manufactures much cotton-seed oil. Omaha is the commercial distributing point for a wide area and the third largest packing center.

gateways through which many of the products of Montana, the Dakotas, Minnesota, and northern Wisconsin reach the consuming and manufacturing centers. Chicago has water communications through the lakes, the Erie Canal, and the St. Lawrence River with the Atlantic, by canal and the Illinois River with the Mississippi system, and is joined by rail to all important points on the seaboard and all the large commercial centers of the interior. These advantages have made it the second city in population in the country, the largest distributor of grain and meat products, the largest slaughtering and meat-packing center in the world, the first of lumber markets, and a producer of great quantities of clothing, furniture, leather goods, steel rails, and many other articles. After Chicago, Duluth, and Superior, Milwaukee is the largest shipper of grain, one of the largest producers of malt liquors, and has important pork-packing, flour, railroad car, leather, iron and steel, and other manufacturing interests. It sells a great deal of the fine cream-colored brick known as Milwaukee brick, made of clay that abounds in some parts of Wisconsin. Detroit is a center of lake trade and of commerce with Canada. Its tobacco, iron, copper-smelting, and other industries are very important. Cleveland is the chief lake port of Ohio. It builds many iron and steel vessels, and has extensive industrial development. Buffalo, the western terminus of the Erie Canal, is the great eastern terminus of the lake trade, except that which passes through the Welland Canal. It is naturally, therefore, a focal point for railroads competing with lake vessels and canal boats for heavy freight and especially for the grain and lumber trade. Railroads from all the large northeast seaports and from the large markets of the west converge at Buffalo. It has large manufactures and is one of the most rapidly growing cities in the country.

The usefulness of canals has largely declined with the growth of railroads. The Erie Canal, opened in 1825, was

long the most important means of communication between the Atlantic seaboard and the developing regions around the Great Lakes. It gave New York city its supremacy as a seaport and as a distributing point for the interior. The most important articles of freight are grain, lumber, coal, ores, iron, and salt, general merchandise being only a small item. The canal now carries only a small part of the grain that reaches New York, for heavy steel rails and powerful locomotives enable one engine to haul large cars carrying 40,000 to 50,000 bushels in one train.

About 2,000,000 freight cars and 45,000 passenger cars are running on the railroads of the United States. Their net earnings a year are between $450,000,000 and $550,000,000. The railroad mileage (p. 44) is greater than that of the whole of Europe and more than a third of the mileage of the world (Figs. 74 and 75). For many years railroads

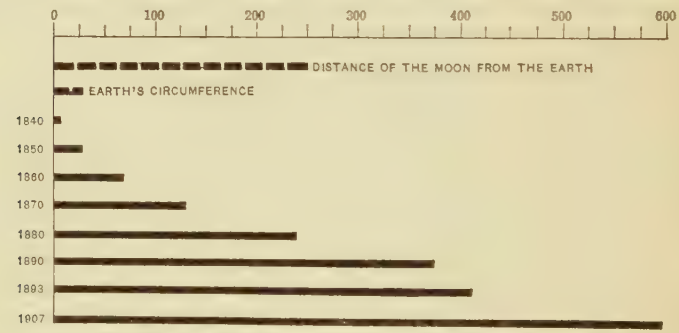

FIG. 74.—Growth of the world's railroads, in thousand miles.

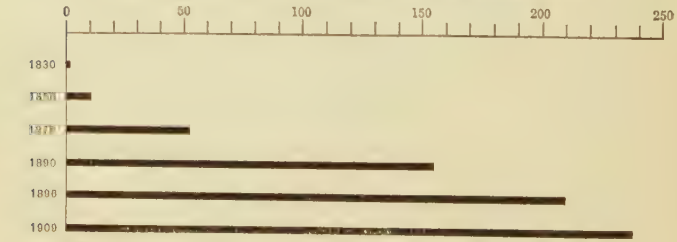

FIG. 75.—Growth of railroads in the United States, in thousand miles.

(Fig. 76) were constantly extending into virgin regions westward, and were the most potent influence in promoting rapid settlement and development. The Federal Government gave large grants of land to companies building roads to the Pacific Ocean across hundreds of miles of sparsely settled territory. These lines, the Great Northern, the Northern Pacific, the Union and Central Pacific, the Southern Pacific, with their eastern connections, form continuous and roughly parallel highways from the Atlantic to the Pacific. All important ports on either ocean have comparatively direct rail connections with the other ocean, and all the great inland commercial centers, as Chicago, St. Louis, Kansas City, and others, have not only lines forming the direct routes between them and both oceans, but also connections that give them rail communication with practically all the ports of the country.

The east and west lines have been most important, because they lead to the seaports having the largest coastwise and foreign sea trade, also because they pass through the chief manufacturing centers where the population is most dense and the demand for food supplies and raw materials for the factories is greatest. But the recent large development of southern manufacturing and of the ocean trade of southern ports is constantly increasing the importance of the north and south lines. Such routes as the coast line from New York to Jacksonville, New York through Atlanta to New Orleans, Cleveland through Louisville to New Orleans, Chicago through Cairo to New Orleans, St. Louis to Galveston, and others are great factors in the country's business. The development of New Orleans, Galveston, Mobile, and other southern ports tends to reduce export freight rates. In 1899 the rate of export grain from the Missouri River was the lowest ever known, and was due to the competition of the roads leading to the Gulf with those leading to eastern ports.

A great many freight and passenger cars are transferred at junction points from one line to another, so that passen-

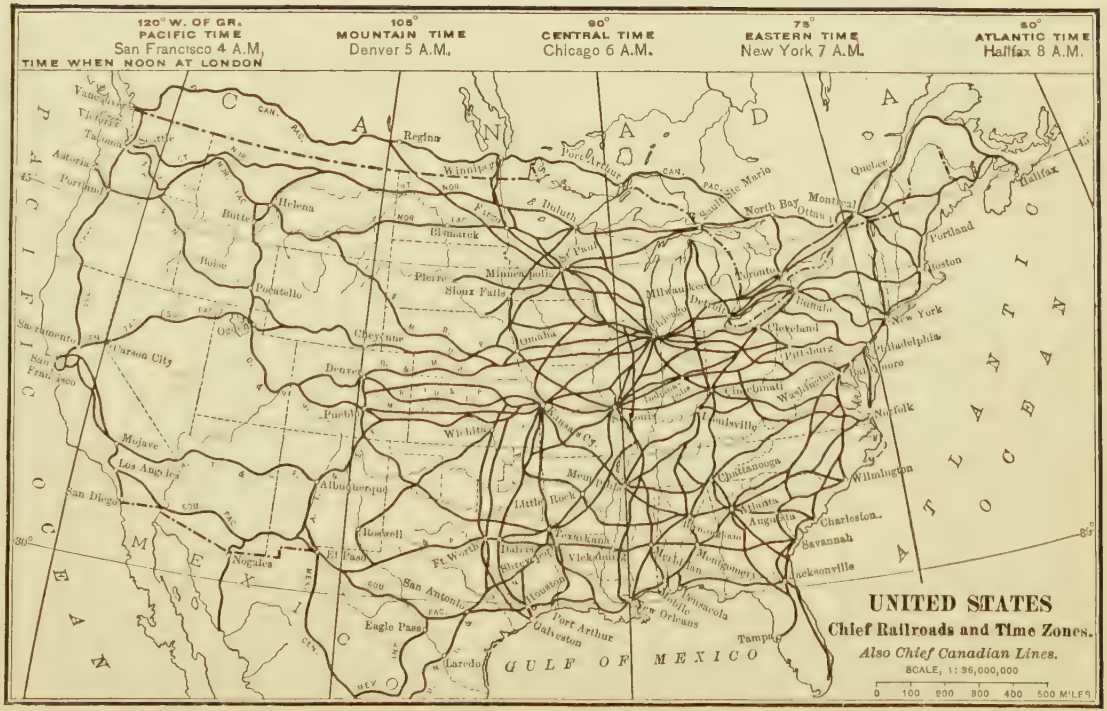

FIG. 76.—Only main lines of railroads are shown on this map. They have hundreds of feeders, the entire railroad system covering the eastern half of the country like a fine network. Observe the convergence of lines at the chief commercial points; also the five time zones, differing by one hour, used for railroad and telegraph purposes in the United States and Canada (p. 35).

gers and freight pass over the lines of different companies with the same facilities as though the roads belonged to one company. At Buffalo, Boston, Atlanta, Louisville, and some other junction points, railroad clearing houses are maintained for the settlement of accounts between the railroads; by balancing debits and credits a great many transactions are settled without exchanging cash.

The coasting trade of the United States is the largest in the world. It is about twice as large as the coasting trade of Great Britain. It includes seagoing steamships plying from New York, Boston, Philadelphia, and Baltimore to Richmond, Charleston, Savannah, Jacksonville, New Orleans, Galveston, and other ports, the large passenger steamers of Long Island Sound, and many sailing vessels and fishing craft. Many steam and sailing vessels are engaged in the Pacific coast trade between San Francisco, Portland, Ore., and Puget Sound ports. The vessel tonnage engaged on the Atlantic and Gulf coasts is more than 2,600,000 tons, about five times as much as that of the Pacific coast, twice as much as that of the Great Lakes, and ten times as much as that of the rivers, exclusive, however, of river barges. As the coasting trade is strictly reserved by law to vessels under the American flag, the only competition to which the United States shipping engaged in it is subjected is that of the railroads.

An important part of the foreign ocean trade of the United States is with British North America, the West Indies, and Latin American ports on the Gulf of Mexico and the Caribbean Sea. Half of this trade is carried in American vessels, and steamers often make from thirty to fifty trips a year.

The deep-sea trade embraces more than four fifths of all the foreign exports and imports by sea. As nearly all voyages in this trade exceed 2,000 miles, one vessel can make only a small number of trips a year. The best record between America and Europe is held by the steamer St.

Louis, which has cleared from New York to Southampton fifteen times in one year. In 1899 only 8 per cent. of the vast volume of the United States deep-sea commerce was carried in American ships.

One of the greatest needs of the United States is a large ocean-carrying merchant marine. In the fiscal year 1898–'99 the country is said to have paid to foreign companies $169,000,000 for freightage, $28,000,000 for passenger fares, and $17,000,000 for marine insurance. Because the country in that year sold over $600,000,000 more goods to foreign lands than it bought from them, some writers called this sum the balance of trade in favor of the United States. The correct balance, however, was to be found only by deducting from the excess of exports at least half the amount paid for foreign transportation and insurance.

A small class of fast steamships, driven by very powerful engines, sacrifice freight room to passenger accommodations, though much freight is carried. Most of the passenger and freight boats are smaller and slower. Some of the regular lines have recently introduced very large freighters with proportionately small or no passenger accommodations. They sail from New York to Bremen, Hamburg, Southampton, Liverpool, and London, and are driving tramp steamers off the regular routes. Tramp steamers which take cargoes where they can get them, entering ports mainly south of New York, are becoming more and more confined to ports that regular lines do not reach. Sailing vessels have a small part in the trade. Clipper ships, famous for quick runs, still ply on the Cape Horn route to San Francisco, and to some extent between Pacific ports and Europe.

New York, the second largest city in the world, is the port of most of the regular steamship lines between Europe and the United States. It is the outlet for over one third of all the domestic exports, and receives a larger proportion of imports. Breadstuffs, provisions, cotton, and petroleum form about one half of its exports. Most of the coffee, dry

goods, crude rubber, precious stones, furs, wine, and tin plate, about half of the sugar, raw silk, leather, and leather goods, and a third of the wool bought in foreign lands are imported through New York. As the city has 353 miles of water front, half of which may be improved for the use of shipping, and as the piers of Jersey City and Hoboken, in New Jersey, are practically a part of the port of New York, its 90 miles of pier line, already surpassing all other ports, may be largely extended. The foreign movement of the port, or the capacity of vessels in the foreign trade entering or leaving it, is about 24,000,000 tons a year. It now leads all ports in the amount of shipping tributary to it. About seventy steamers in the foreign trade leave the port every week, half of which sail under the British and one eighth under the American flags, the remainder being mostly German, French, Scándinavian, Belgian, Dutch, and Italian vessels. The foreign commerce in 1906 was $1,341,511,137.

New York is the financial center of the country, and the enormous extent of its business interests may be largely gauged by the exchange of bank checks through the clearing house, which in the year ending September 30, 1901, amounted to an average of $254,193,638 on every business day. United States seaports usually develop industries in proportion to their population, and New York is the greatest manufacturing center of the country.

Boston, with 4,600,000 tons foreign movement, is the second of the four great world ports on the Atlantic coast, surpassing Philadelphia and Baltimore in the extent of its commerce. It has regular connections with Liverpool, London, Hull, Glasgow, and some other European points, does a large coasting trade with Canada and the Southern states, and is a large cotton and leather and the largest wool market. It does much export and import trade for New England, and exports many western food products.

Philadelphia, with over 4,500,000 tons foreign movement, has regular lines of steamships to Liverpool and

Antwerp, the West Indies, and also in the coasting trade. The Delaware is deep enough to carry vessels to the port at low tide. A great deal of raw sugar is brought from the West Indies for the refineries, wool for the carpet factories, and iron ore for Pennsylvania works.

Baltimore, with over 2,200,000 tons foreign movement, 140 nautical miles from the sea, is nearer the Mississippi Valley than is New York, is in close touch with it by rail, and attracts most of the commerce of Chesapeake Bay on account of its superior position, both with reference to navigation and the products of the bay. It is the center of the largest source of oysters in the world, and one of the leading fruit regions of the country. It is the second port in the export of maize, flour, and tobacco, and is surpassed only by New York and Boston in the exports of wheat. It is the most southern port shipping live cattle.

New Orleans, with over 2,100,000 tons foreign movement, 107 miles from the mouth of the Mississippi River, receives four fifths of the products which enter the city by rail, river, and canal from the interior; one tenth are brought by coasting vessels and one tenth by foreign vessels. New Orleans is the first cotton and wheat port in the world. About one half the export cotton goes to England, one fifth to France, one seventh to Germany, and Russia, Italy, Spain, and Belgium are also purchasers. Cotton-seed oil, grain, flour, and tobacco are also important exports.

The larger part of the exports of San Francisco, with over 1,700,000 tons foreign movement, are sent to Europe, and the larger part of the imports are derived from Asia and the Hawaiian Islands. The tonnage entering the port is about equally distributed between the foreign and the coast trades. Wheat, lumber, flour, canned salmon, cotton goods, preserved fruits, machinery, etc., are the chief exports. It is a large sugar market, for it receives nearly all the raw sugar of Hawaii, and its convenient situation in respect to the Asian markets makes it the largest importer

of teas and raw silk except New York. Rice, tobacco, and opium are also large imports from Asia, coffee from Central America, and coal is brought from Australia, Washington, and British Columbia. San Francisco is one of the few ports in which the trans-ocean traffic by sailing vessels is proportionately quite large. This trade is mainly with England. Regular steamship lines connect the port with Panama and Mexican ports, Honolulu, Yokohama, Hongkong, Auckland, and Sydney; and coasting vessels supplement the railroads in the trade between other Pacific ports of the country and San Francisco, which is the central distributing point for the Pacific coast states.

PERCENTAGES OF EXPORTS FROM UNITED STATES PORTS

Year.	New York.	Boston.	Philadelphia.	Baltimore.	New Orleans.	Galveston.
1868..	46.0	4.46	3.07	3.62	15.22	1.53
1888..	44.6	8.11	4.14	6.62	11.66	2.26
1899..	37.4	10.43	5.05	8.90	6.39	7.17

TONNAGE OF MERCHANT MARINE IN 1909 (IN MILLION TONS)

Atlantic and Gulf.	Pacific.	Hawaii.	Lakes.	Western rivers.
3.50	0.92	0.19	2.78	0.62

RAILROAD FREIGHT RATES PER TON MILE

	1870.	1890.
Lines east of Chicago	1.61 cents.	0.55 cent.
West and northwest lines	2.61 "	0.89 "
Southwest lines	2.95 "	0.91 "
Southern lines	2.39 "	0.63 "
Transcontinental lines	4.50 "	0.93 "

Average receipts for freight per ton mile on all United States railroads, in 1909, 0.77 cent.

Owing to increased wages and other causes railroad freight rates advanced considerably after 1901. The tendency is to send more export grain and some other commodities to the Gulf ports for shipment at the expense of the Atlantic ports. A railroad may not make rates so high as to make it unprofitable to ship products to market, for in that case it loses business.

CHAPTER XVI

THE UNITED STATES (*Continued*)

General Facts of Commerce—The Trade of this Country

The value of trade among all countries of the world increased three fourths in thirty years (1867–'97). There are many reasons why commerce is rapidly growing in volume (p. 166). One is that the world's population, now estimated at 1,500,000,000, is constantly increasing. The whole population of Europe at the time of Augustus Cæsar is believed to have been only 50,000,000, about half the present population of European Russia. With constantly growing numbers the standard of living and comfort among civilized peoples has greatly advanced, and their needs have multiplied. It is much easier and cheaper now to procure commodities, by reason of the great development of transport facilities and the consequent reduction in freight rates. Machinery has enlarged the capacity for production, reduced its cost, and thus cheapened commodities so that many articles which were once luxuries enjoyed only by the few are now found in nearly every home. In years of financial distress or large crop failure the value of the world's exchange of commodities is reduced for a while, but the growth of business is not long retarded.

The domestic or internal trade of any country is larger than its foreign trade. If our neighbor the grocer gives us just as good advantages as his rival in business a mile away he will probably secure our trade. This is the case also in

the larger affairs of commerce. The United States produces most of the commodities of all kinds that it needs; and because the home products are good and cheap, and the markets are at our doors, we need to send thousands of miles for comparatively few of the things we buy. Our own commodities carried from one part of the country to another for sale at home are worth about $30,000,000,000 a year, which is thirteen times the value of our entire foreign trade. The citizens of this country buy $40 worth of home products for every dollar they expend for foreign commodities. The foreign trade of the United States, therefore, is of small importance in comparison with its home commerce.

The same rule applies in all other great trading nations. The value of the internal trade of the United States in proportion to population is greater, however, than that of any other country, because Americans spend more for food, clothing, rent, and many comforts of life than any other people. The wealth of the United States, estimated at $98,000,000,000, is equal to the combined wealth of Russia, Italy, and Spain, is double that of Germany, nearly double that of France, and a fourth larger than that of the United Kingdom. Thus the purchasing power of the people is in striking contrast, for example, with that of the inhabitants of British India, the masses of whose population are very poor.

Europe is the center of the largest volume of ingoing and outgoing commerce. It commands about three fourths of the world's trade (p. 166). An important feature of Europe's trade is that its imports are invariably greater than its exports. In this respect it differs from the other continents, excepting Africa. The reason is that Europe needs to import such enormous quantities of food for its dense population, and of raw materials for its vast industries, and so much of its products are consumed at home that the value of its sales to foreign lands is less than that of its purchases from them. Trade flows from places where

there is an abundant supply of any commodity to those where there is scarcity and a demand; thus wheat, meat, and cotton are constantly moving across the Atlantic, from America to Europe, and many other supplies pour into European ports from all parts of the world.

On the other hand, America, with the United States as its chief factor, and Asia have long sold to other continents a larger volume of commodities than they have purchased from them; Australia is beginning to do so, but Africa imports more than it exports, largely because the foreign commodities required by the pioneers who are developing that continent still have an excessive value in proportion to African exports.

Europe is the center of the largest volume of outgoing commerce, because its manufactures have had centuries of development, and a demand has been created for them in all parts of the world.

It is important to create foreign markets for manufactured goods. Those nations thrive best in trade whose foreign commerce includes a large proportion of manufactures. The percentage of profit on manufactures is much larger than on food stuffs and the raw materials of which goods are made. Raw materials are more readily marketed, and it costs more time and money to develop trade in manufactured commodities; but when this trade is once built up, it is not only more profitable than the trade in raw materials, but is less vulnerable to competition and other influences. Thus the export trade in farm products thrives or languishes according to the climatic conditions both in selling and buying countries. If the sun and rain help the American farmer to gather unusually large crops in any season, the sale of farm products to food-buying countries may be much larger than usual, provided the farmers of those countries have had a poor crop year. These conditions existed in 1898, when the United States exports of breadstuffs were one fourth larger than in 1897.

If a country has an agricultural product which is reasonably constant in quantity, and of which it possesses a practical monopoly, there is not likely to be large fluctuations in the sales at home or abroad. This is the case with cotton in the United States and Havana tobacco in Cuba.

Nearly a third of the exports from the United States are manufactures (1909). In 1890 four fifths of the exports were agricultural products; but machinery and improved manufacturing processes enabled this country, in the last decade of the nineteenth century, to compete with the older industrial nations of Europe in the sale of manufactures. Though this country still pays high wages to labor, many of its manufactures are sold as cheap or cheaper than European products, because machinery and skill in using it have increased the productive capacity of American workmen. Taking the producing capacity of the average British workman at 1, that of the Swiss or German workman is estimated at $1\frac{1}{2}$, and of the American workman at $2\frac{1}{4}$. Superior producing power is thus a vital factor in making this country a great trading nation. The largest markets for American manufactures are in the leading industrial countries, showing that many American products compete with European wares in their own home markets.

The foreign trade of the United States was $3,203,815,815 in 1909. Commodities worth about $10,200,000 come into or pass out of the country on every work day of the year. Two thirds of these commodities are exported from the country, for it sells to foreigners a great deal more than it buys from them (p. 167). Nearly one half of the imports are raw materials for our mills and factories, or materials that are partly prepared for manufacturing. A large part of the imports also are such food stuffs as sugar, coffee, and tea, which we produce only in limited quantities if at all. Only a small part of the imports, therefore, consist of luxuries and general merchandise, and Europe supplies most of them. The growth of the country as a manufacturing

nation is further shown by the fact that the imports from countries which supply chiefly manufactures are decreasing, while they are increasing from countries such as Japan, Argentina, and Brazil that furnish raw materials.

World's Commerce (in Million Dollars)

Year.	Imports.	Exports.	Totals.
1880	8.565	7.390	15.955
1885	8.220	7.203	15.423
1890	9.500	8.156	17.656
1897	10.284	8.900	19.184
1907	17.277	15.490	32.767

World's Commerce by Continents (in Million Dollars)

		1882.	1891.	1897.	1907.
Europe	Imports	6,426	6,783	7,169	11,460
	Exports	5,067	5,123	5,415	9,085
America	Imports	1,400	1,479	1,500	3,025
	Exports	1,529	1,671	1,894	3,505
Asia	Imports	603	773	924	1,835
	Exports	771	884	962	1,802
Australia	Imports	328	359	264	372
	Exports	264	335	290	465
Africa	Imports	226	237	425	587
	Exports	167	227	339	625

Annual Trade of the United States (in Million Dollars)

	1871–'75.	1881–'85.	1891–'95.	1898.	1899.	1902.	1909.
Imports	578	667	780	616	799	903	1,312
Exports	486	774	872	1,210	1,275	1,355	1,638

Chief Articles of United States Exports in 1904 (in Million Dollars)

Breadstuffs	149	Lumber and manufactures	52
Cotton	368	Copper and manufactures	57
Meat and dairy products	176	Tobacco, unmanufactured	30
Iron and manufactures	112	Leather and manufactures	34
Oils, mineral	52	Cotton goods	22
Animals	48		

DISTRIBUTION OF U. S. COMMERCE WITH LEADING COUNTRIES IN 1908 (IN MILLION DOLLARS)

	Exports.	Imports.		Exports.	Imports.
United Kingdom	604	104	Japan	27	65
Germany	305	121	Australia	29	11
France	127	61	Brazil	21	86
Canada	180	68	China	27	15
Netherlands	129	81	Argentina	34	12
Belgium	66	14	Venezuela	3	5
Italy	78	39	Central America	13	11
Mexico	45	86			

GROWTH OF EXPORT TRADE IN MANUFACTURES (PERCENTAGE OF TOTAL EXPORTS)

1890.	1895.	1898.	1899.	1900.	1910.
17	23	24	24	31	41

IMPORTS INTO THE UNITED STATES, 1903 (IN MILLION DOLLARS)

Food and Animals.	Materials for Manufacture.	Manufactures.	Luxuries, etc.
212.0	470.8	169.2	145.8

EXPORTS FROM THE UNITED STATES, 1903 (IN MILLION DOLLARS)

Agriculture.	Manufactures.	Mining.	Forest.	Fisheries.
873.3	407.5	39.3	57.8	7.8

PERCENTAGE OF UNITED STATES TRADE WITH GRAND DIVISIONS IN 1902

	Europe.	North America.	South America.	Asia.	Oceania.	Africa.
Imports..	52.60	16.72	13.26	14.36	1.57	1.49
Exports..	72.96	14.76	2.75	4.63	2.48	2.42

CHAPTER XVII

UNITED STATES COLONIES AND CUBA

PORTO RICO—THE TERRITORY OF HAWAII—GUAM—TUTUILA—THE PHILIPPINE ISLANDS—CUBA

Porto Rico is a land of small farmers. Four fifths of the population live in the rural districts. The island (Fig. 77), ceded by Spain to the United States in 1898, is about three times as large as Rhode Island. With 1,118,012 (1910) inhabitants, it surpasses in density of population all the states, except Rhode Island and Massachusetts. The density of population is more than seven times that of Cuba. The main reasons are that Porto Rico is the most healthful island of the Antilles, and that when it was a colony of Spain that country encouraged settlement by allotting lands gratis, and by exempting colonists from direct taxation.

There are alluvial plains near the coasts, but nine tenths of the island is volcanic mountains and limestone foothills. The higher mountains, extending through the center, east and west, condense the moisture-laden trade winds, with the result that the northern part of the island has an abundant rainfall; the southern part is irrigated in the dry periods. Rivers in the north therefore better serve transportation purposes than in the south; more of the larger coffee and sugar plantations are in the north, whose ports have therefore the larger commercial movement.

The Creoles, Spanish descendants of the better class, live in the towns and control business. The other classes

are the Gibaros, or white peasantry, the negroes, numbering only about 50,000, and the Mestizos, or mixed white and black races.

Cattle on the hills cost almost nothing to keep. Fruit farms on the lower slopes and in the valleys predominate, but maize, mountain rice, as well as much coffee and to-

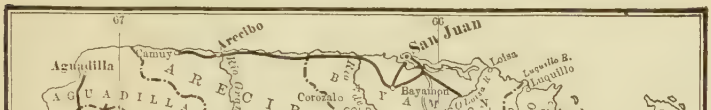

FIG. 77.—PORTO RICO.

Playa, accommodating vessels of 25 feet draught, is the port of Ponce, and the best seaport, but San Juan has the larger commercial movement. It is difficult for ships to enter the narrow harbor of San Juan when a norther blows. San Juan is the capital and largest city. Ponce, the second city, is a busy trading and shipping point. Mayaguez, the third city, is second only to San Juan in coffee exports, and receives a third of the flour sent to the island. Aguadilla prepares coffee for export and makes rum from molasses. Arecibo is merely an open roadstead, but the Rio Grande makes it a center for receiving and distributing commodities. Fajardo and Arroyo export raw sugar and molasses. Industries, confined mainly to these ports and the inland towns of San German and Naguabo, include the preparation of sugar and coffee for market, and the manufacture of tobacco, chocolate (at Mayaguez), soap, matches, brooms, rum, straw hats, and petroleum refining (at San Juan).

bacco, and other common food crops are raised on small farms. The larger sugar and cotton plantations are mainly on the narrow alluvial plains. The coffee estates are high up on the hills where the crop grows best. The finest tobacco districts are in the mountain region of the interior, and the choicest leaf is grown along the road from Ponce to San Juan, in Ponce and Guayama provinces. Building and cabinet timbers and dyewoods grow mainly in the higher parts of the island. The mineral resources are not

large. Salt is obtained by evaporating brine at Cabo Rojo, Guanica, and Coamo, which supply the island. Magnetic iron, near Juncos, is the most valuable mineral resource yet discovered. Gypsum, near Ponce and Juana Diaz, is important in a land where much plaster is used for stucco, and fertilizers are needed.

Most roads are mere paths, but the United States Government is remedying this defect. A fine macadam road extends from Ponce to San Juan, and several sections of the railroad, which is to skirt the entire coast, are in operation. Nearly all the important commercial towns are seaports (Fig. 77). By means of the navigable rivers goods are sent from the coast towns and products taken to them in canoes and flatboats propelled by poling.

The agricultural staples being coffee, sugar, tobacco, and fruit, it is obvious that the densely peopled island needs to import large food supplies. Nearly half the imports ($26,000,000) is food—mainly rice from the other West Indies, cured fish from Canada, and meat, lard, and flour from the United States. As manufactures are restricted, nearly half the imports are cotton cloths, shoes, fancy goods, and household articles, purchased mainly in England, Germany, and the United States. The island has free trade with the mother country. The exports more than equal the imports, sugar, coffee, and tobacco being the staples of this trade. In 1895 coffee comprised about 60 and sugar 28 per cent of the exports, but sugar is now far ahead of coffee. A great deal of tobacco is sent to Cuba for manufacture into cigars; practically all the sugar and molasses and a small part of the coffee come to the United States.

The Hawaiian Islands are at the crossroads of trade in the central Pacific. They form a territory of the United States, annexed in 1898, and include eight inhabited islands (Fig. 78). Though the area is nearly twice that of Porto Rico, the population is only about one ninth as large. The group

is far from all other lands, but its position at the meeting point of trade routes in the central Pacific (Fig. 1) gives it great advantages in frequent and regular steam communications with America, Asia, and Australia. The ship canal

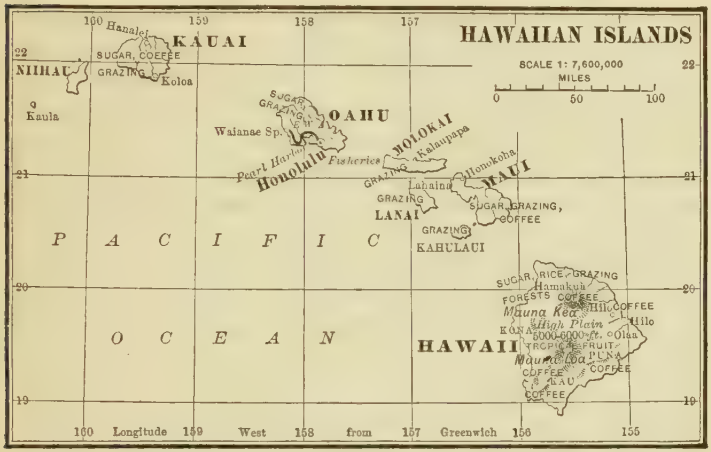

FIG. 78.—Honolulu is an important way station between Australia and Asia on one side and America on the other, being connected by regular steamship lines with the three continents (Fig. 1). Steamers and sailing vessels ply between Honolulu and other island ports, carrying merchandise to the islands and bringing their sugar and other export products to the capital for shipment. Hilo, on Hawaii, is the second port in importance. All the islands have ports, some of which have been improved, so that (1892) American vessels call for sugar and coffee, and discharge merchandise direct from the United States.

between the Atlantic and the Pacific will give the islands still larger participation in the world's trade.

The islands are conspicuous for high volcanic mountains and fertile plains and valleys. Hawaii has nearly two thirds of the total area; but Oahu, which is as large as the Society group, is the most populous and by far the most important commercially, for it attracts settlers and ocean trade on account of the superiority and central position in the group of Honolulu harbor. Maui corresponds in size with the Marquesas group, and the island of Hawaii is

nearly as large as all the other island groups of Polynesia. Thus both the position and size of the group give it a far greater importance than that of any other islands in Polynesia.

The climate, which is healthful and agreeable, is about ten degrees cooler than any other land in the same latitude, owing to the northeast trade winds, which refresh and strengthen animal and plant life. Great quantities of rain fall on the windward side of the mountains, and much less on the leeward side; but most parts of the islands usually have all the rain required by the crops. Sheep and cattle graze on the mountain slopes, and large sugar and rice plantations are on the fertile lower lands.

The inhabitants (191,909 in 1910) live mainly along the coast. About one fourth are native Hawaiians, who are rapidly decreasing. About three sevenths are Chinese and Japanese. There are 11,000 Portuguese. The Americans, British, and other European elements are rapidly increasing. They control the planting and commercial interests, which are mainly in the hands of settlers from the United States and their descendants.

Raw cane sugar is the staple product, the territory being one of the largest producers of this commodity. About 500,000 tons of sugar are produced every year. Nearly all the money not needed in business goes into sugar planting. The plantations are owned by stock companies, and both rich and poor buy the stock, which is nearly all held in the islands. Any cause that lowers the price of sugar makes every one poorer. Rice and bananas are the next largest crops. Coffee planting is still a young industry. Much attention is given to tropical fruits, and the breeding of domestic animals. Continuous cropping, without alternation of crops, makes fertilizers necessary, and about 10,000 tons a year are prepared in the islands, in addition to large imports from the United States and Europe. All lumber is imported from the United States, fir, spruce, and

cedar coming from Puget Sound, and redwood, oak, ash, and hickory from California. Wearing apparel, dry goods, and tobacco manufactures are large imports. Bagging is brought from India, coal from Australia, and cement, crockery, tin plate, and some other articles from Europe. About 75 per cent of the imports in 1909 came from the United States, and 10 per cent from Great Britain. Raw sugar is the only export of large importance, comprising over nineteen twentieths of the total. It is sent mainly to California refineries.

Honolulu, the capital of the territory, contains one fourth of the population, and is the chief seaport and commercial center (Fig. 78). The islands have long been as closely bound to the United States by business relations as Algeria is to France. Nine tenths of the total trade is with the United States, which being only about 2,000 miles from Honolulu, offers reduced freight rates, and therefore cheaper commodities. A reciprocity treaty with the United States gave a great impetus to the development of the islands. Manufactures are the largest imports; machinery is the largest item. The iron works at Honolulu turn out much sugar machinery, but all farm implements, small locomotives for the sugar estate railroads, other rolling stock, hardware, and many other articles are bought in the United States, as are the large imports of groceries and provisions.

Guam is the largest island in the Ladrones (Fig. 20). This island was ceded to the United States by Spain in 1898. Its area is about 390 square miles. It produces copra for export, and is a coaling and cable station.

Tutuila has one of the best harbors in the Pacific. It is a volcanic island in the Samoan group, containing less than 60 square miles, and came into the possession of the United States in 1899. Pago-Pago, its fine landlocked harbor, is useful as a coaling station, and likely to become a port of call for steamers. Copra is the largest export product.

The Philippines are the largest island group of the Malay Archipelago (Fig. 79). Luzon is the fourteenth in size and Mindanao the sixteenth among the large islands of the

FIG. 79.

world. The group is nearly as large as the New England states, New York, and New Jersey. If its northern edge were placed upon Chicago, its southern edge would touch Cuba.

Volcanic mountain ranges are the predominant topographic feature. Most of the valleys are narrow, but where the land widens between the mountains, as in central and northern Luzon and Mindanao, there are comparatively broad, well-watered plains. These plains and the valleys are tillable, but not more than a third of the surface is adapted for agriculture. The climate is tropical, the temperature ranging between 60° and 100° F. Being an insular climate, the night breezes usually afford some relief from the heat of the days.

The population, mostly Malayan, is densest in Luzon and the Visayas, or central islands. It is least dense south of the 10th parallel, where the smallest progress has been made. Most of the trade with foreign countries is as yet confined to the islands north of the 10th parallel.

The capacity of the people for advancement has been demonstrated. They are closely related by race and character to the Javanese who, under the Dutch *régime*, have made their islands one vast garden. The white residents, about 25,000, are Spanish, American, British, and German. The external trade, except with Spain, has been stimulated chiefly by British, American, and German merchants. About 50,000 Chinese in the seaports and other towns engage in many trades, and the wealthier have an important share in the retail, wholesale, and banking businesses.

The great agricultural resources are mostly undeveloped. The methods of tillage are so crude and so much good land is unoccupied that the production may be increased over tenfold. The coast lands, plains, and valleys, from north Luzon to south Negros, produce large quantities of Manila hemp (p. 103), raw sugar, tobacco, cocoanuts,

and copra. These are the chief articles of export. Manila hemp, which is in great demand, comprises about one third of the exports. The islands have a monopoly of the culture, and the development of hemp raising is one of the brightest prospects. The United States and Great Britain take nearly all the crop. Raw cane sugar is over one fifth of the exports, but is coarse and brings a low price (compare Cuba, p. 179). The United States, Great Britain, Japan, and Spain buy most of it. The best tobacco is raised in the wide valley of the Cagayan, in north Luzon, and is shipped to Manila, from Aparri, for manufacture into cigars and cheroots. It holds the place in eastern commerce that Havana tobacco does in western trade. Most tobacco raised south of Manila is not so fine, and much of it is shipped in leaf to Spain. The cocoa palm attains perfection; large quantities of copra, the dried kernel of the cocoanut, are sent to Marseilles for soap making. Two crops of rice, the staple food, are raised annually, but the enormous product does not meet the demand and large quantities are imported, mainly from Cochin China. Coffee, pepper, and cotton are raised, but are not yet commercially important. Nearly all tropical fruits are grown. The forests are among the finest in the world, growing many of the finest cabinet and dyewoods, as yet little utilized. Minerals are widely distributed (Fig. 79), but this source of wealth is not yet developed. Manufactures have little development except at Manila, where cigar making is the largest industry, and sugar refining, distilling, cotton spinning, and a few other enterprises are established.

By far the most important seaports are Manila, Iloilo, and Cebu. Most of the sugar exports from Manila are produced in Luzon, while those of the central islands are shipped largely from Cebu. Manila Bay is one of the finest harbors in the world; the port occupies a central position between the Asian coasts and the Malay Archipelago, and is destined to be, like Hongkong and Singapore, a great

PULLING FLAX.

HARVESTING HEMP.

collecting and distributing point for the trade of those regions.

Telegraph and cable lines to connect all the islands and interior points with the coasts are being built. The main ports are connected by cable with San Francisco and Hongkong and thus with the world's cable system (Fig. 6). Manila has regular steam connections with Hongkong, Singapore, Yokohama, and Australia, and a monthly service to Liverpool via Barcelona.

While the United States has long bought a fourth or more of Philippine exports, its share in the imports has been insignificant, but its new relations with the island have naturally developed a large import trade. The principal imports are cotton cloths, hardware, and machinery. Russian kerosene has thus far competed with the American article. The export and import trade are nearly evenly divided.

Cuba is the largest fertile island in America (Fig. 80). About one half of the total area of the West Indies is embraced in it. Few lands have greater natural commercial advantages. Its coasts, indented to a remarkable degree, provide many excellent harbors. The island does not attain great elevation. Its three natural divisions are (1) the western mountains (Sierra de los Organos), on whose southern slopes the best tobacco is raised; (2) the fertile central plains, interspersed with hills, where most of the sugar cane is grown, giving also pasturage in times of peace to over 2,000,000 cattle; and (3) the higher eastern mountains, with intervening valleys and plateaus, where agriculture is most diversified, but the total product is least important. The climate is hotter than that of Porto Rico, but for a tropical country it is favorable for the white races, largely because the island is well drained by many streams, except in the Zapata swamp region.

More than half the population are native whites of Spanish origin. Many Spanish immigrants live in the

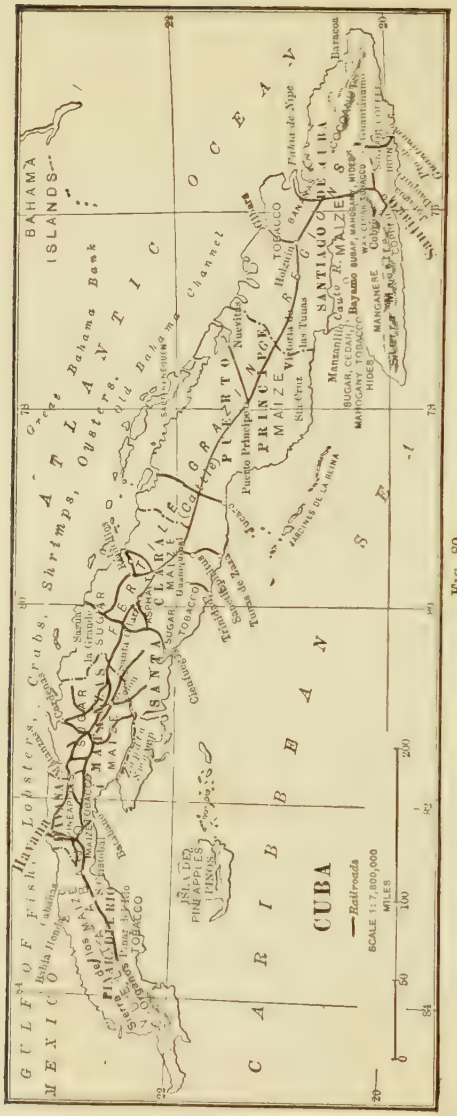

Fig. 80.

cities and engage in commerce. About one half of the people are negroes or mixed races. Agriculture is the main pursuit. Most of the labor in the tobacco fields is white, while that in the sugar-cane fields is black, and not always in adequate supply.

The staple crops are cane sugar and tobacco. On the success of these crops depends the prosperity of the island. Cuba is the largest cane-growing country in normal times, when it produces fifty per cent more raw sugar than Java, its nearest competitor. The pre-eminence of the island is due to three factors: (1) The fertility of its soil, which produces

seven crops with one planting and without fertilizers; (2) the use of all modern inventions for improving and cheapening the product; (3) the proximity of the United States, by far the largest cane-sugar market in the world. The best machinery and methods enable Cuba, Java, and the Hawaiian Islands to produce the best cane sugar (Fig. 45). In Cuba large sugarhouses, equipped with expensive machinery, work the cane of one or more plantations brought to them by light railroads; the best labor-saving inventions are used for cultivating the cane and for extracting and crystallizing the juices. Sugar and molasses are thus produced so cheaply that the crop is profitable, though in the other West Indies the decline in prices has crippled the industry; but much of the sugar plant was destroyed during the war.

Tobacco in Cuba is a more stable crop, because its success depends solely upon the amount of the harvest. It is not affected by competition, because Cuban tobacco, particularly that of the Vuelta Abajo region in the west, has a distinctive aroma that establishes a demand at good prices and places it in a class by itself. The crop is not large, that of the United States, for example, being seven and of Austria-Hungary five times as great. Large quantities of baled leaf are exported mainly to the United States from Havana, Cienfuegos, Trinidad, and Santiago. Nearly two thirds of the entire crop is exported, including nearly 200,000,000 cigars a year.

Coffee, once an export crop, has declined under competition with Brazil and Java, but its use has extended and the home supply is supplemented by imports from Porto Rico and elsewhere. The cacao tree thrives best on the eastern uplands where most of the cocoa is produced. Cocoanuts and bananas, raised best in the east, are exported from Gibara and Baracoa. The export timber is cedar for making cigar boxes, and mahogany, both from the forested mountains of the east. Manganese from the southeast is

exported to Pennsylvania steel works, and prime iron ore for steel making is shipped from Daiquiri to the United States and Europe.

Development is retarded by inadequate means of inland transportation. Railroads connect the sugar and tobacco lands of the west with the seaports, and some inland towns of the east with the coasts. Roads are very poor. The journey from Santiago to Havana was made by sea till 1903 when the two largest cities were connected by rail.

Havana, the only large city of the West Indies, has a large part of the Cuban sea trade, including one fifth of the sugar and all the "Havana tobacco" exports. Santiago, Cienfuegos, Trinidad, Matanzas, and smaller ports handle the exports of regions immediately tributary to them, and import provisions and manufactured goods.

Cuba's largest trade relations are naturally with its neighbor, the United States. In the four years before the insurrection of 1895 the trade of Cuba with the United States averaged $92,000,000 a year, nearly three times the island's trade with Spain, and eight times its trade with Great Britain, France, and Belgium together. The United States not only buys most of the exports, but also supplies most of the food stuffs that are Cuba's main imports.

While sugar and tobacco are the main export staples, honey, wax, hides, and rum are minor exports. From 1891 to 1894 Cuba sold to the United States commodities worth about four times as much as her purchases from this country, Spain supplying Cuba with most of her imports. In 1909 the United States sold products to Cuba worth one half as much as its purchases from the island.

The largest imports are flour, mainly from the United States, as Cuba raises no wheat, and rice from Europe and the other West Indies. Cuba is the chief customer of the United States in Latin America for enormous quantities of lard, hams, and bacon. Being a Roman Catholic country, a great deal of salt fish is purchased, mainly from Brit-

ish America. Producing no coal, the coast towns buy it in large quantities from the United States and Great Britain. Potatoes and maize are other large imports. Cattle are used for draught purposes, fresh beef, dairying, and hides, but domestic beef is not cured, and jerked beef is a large import from South America. No textiles are produced, but the imports are small in comparison with the food imports. Builders' hardware, railroad materials, kerosene, and lumber are other large imports.

ANNUAL TRADE OF HAWAII (IN MILLION DOLLARS)

	1891–'95.	1897.	1898.	1909.
Imports	5.8	8.8	11.6	21.4
Exports	9.3	16.0	17.3	40.5

TOTAL FOREIGN TRADE (IN MILLION DOLLARS)

	Cuba (1909).	Porto Rico (1909).	Hawaii (1909).	Philippines (1909).
Imports	83.9	2.9	0.4	27.7
Exports	115.6	4.0	0.08	30.9

UNITED STATES TRADE (IN MILLION DOLLARS)

	Cuba (1809).	Porto Rico (1909).	Hawaii (1909).	Philippines (1909).
Exports to	43.9	23.6	17.4	10.2
Imports from	96.7	26.3	40.4	4.7

CHAPTER XVIII

CANADA AND NEWFOUNDLAND

Canada, the most important colony of Great Britain, is very favorably situated for commerce. With the ocean on three sides, and the Great Lakes on its southern border, the markets of Europe, the United States, and the Orient are very accessible. The Atlantic ports are nearer to north European markets than those of the United States. Thus Montreal, though far inland, is 300 miles nearer to Liverpool than New York, owing to the smaller circumference of the earth's surface in the more northern latitude. All the Gulf of St. Lawrence ports, however, are closed by ice in winter. Montreal's sea traffic during the ice months is through Halifax, N. S., and Portland, Me., with which it is connected by rail. Sydney, Cape Breton, is closed by drift ice for three months; Halifax, Yarmouth, and Louisburg, in Nova Scotia, and St. John, in New Brunswick, are open the year round.

Hudson Bay is open four months a year, including the month after the wheat harvest. A railroad may be built from the wheat lands of the central prairies to one of the good harbors at the mouths of the Churchill or Nelson rivers (Fig. 81), thus making a short summer route for grain from Winnipeg to Liverpool.

The ports of Victoria, Vancouver, and New Westminster, on the Pacific coast, are outlets to the markets of the Orient and Australasia. The northern coast is of no value for commerce on account of the climate, but on the southern border the traffic of the Great Lakes

through Toronto, Kingston, Hamilton, and other ports is very large.

The settled areas comprise forest, plain, and mountain regions (Fig. 81). Forests once covered the entire eastern half, but millions of acres, cleared of trees, are now devoted to careful tillage and extensive grazing, so that the chief products of eastern Canada are farm crops, fruit, live stock, cheese, butter, timber, and the fish caught along the coast. The prairies and plains extend through the central region from Manitoba to British Co-

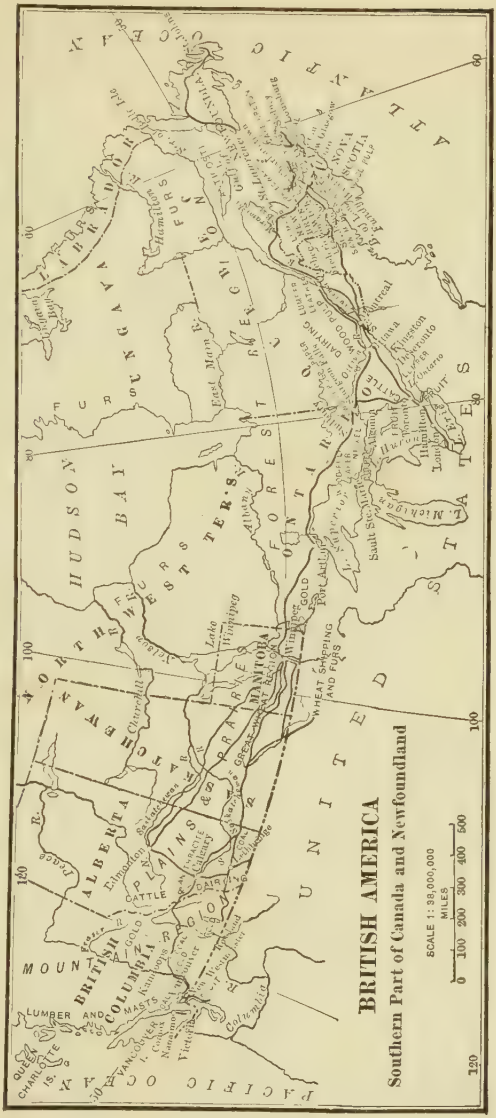

Fig. 81.

lumbia. Nowhere else in Canada can wheat be grown so cheaply as on the prairie lands of Manitoba and in the valleys of the Qu'Appelle and Saskatchewan; in the drier regions of southern Saskatchewan and Alberta cattle, horses, and sheep are raised on many ranches, and dairying is becoming important. British Columbia is the mountain region. The river valleys and deltas of the southern part are rich farming lands, where cereals and fruits are raised. The widespread forests supply many sawmills, and the fisheries are an important source of wealth, but gold, silver, and coal are the most important resources. Width of belts across Canada: Woodland, 2,300 miles; prairie, 1,000; mountain, 600.

The barren lands, extending from northwest Labrador nearly to the Mackenzie River, and the frozen Arctic regions have little value except for their minerals. Abundant evidence of gold, silver, copper, iron, coal, and other minerals has been found in the barren lands, which will be a subarctic mining province when transportation is supplied.

The climate is continental (p. 7). It is a land of cold winters and warm summers. East of the Rocky Mountains snow covers the ground from three to five months, but the growing season is long and warm enough to mature crops, and make Canada a great farming country. Even though the winter at Montreal is as cold as at St. Petersburg, the summer is as warm as in northern Spain. The long summer days ripen maize, which is a staple crop in Ontario and Quebec, though it can not be grown in England. The lakes and rivers are always full, showing that there is abundant rainfall. The moisture is excessive on the mild Pacific coast, but the Rocky Mountains arrest the rain-bearing winds from the Pacific, so that there are dry belts east of British Columbia. Southern Assiniboia is the driest part of Canada. In the great ranching region of southern Alberta irrigation by means of unfailing streams fed by mountain snows has developed agriculture.

Agriculture is the chief industry. Seven-tenths of the people are farmers. One-fourth of the country is capable of tillage, but more than half of the arable lands will not be utilized for a long time, because they lack population and means of transportation. Thus grain and grass lands north of the Saskatchewan, to which the warm chinook winds bring a moderate climate, are a reserve source of wealth. Immigrants are now pouring into Canada, and wheat fields are extending northward.

Wheat and flour are the largest food export (p. 194). Ontario and Quebec long produced most of the wheat, but the present center of its cultivation is the prairies of Manitoba, whose black, loamy soil rests upon a substratum of clay, which keeps the moisture derived from heavy snows within reach of the plant. Most of the Spring wheat is grown on these prairies. The export grain is sent by rail and lake routes to Montreal, which ships most of the wheat, maize, and oats sent out of Canada. Fort William, near Port Arthur, on Lake Superior, and Owen Sound, on Georgian Bay (Lake Huron), are the gateways for the shipment of the western grain crop; and, as it is handled chiefly at these ports and in Montreal, very large elevators have been built at these towns. Most of the wheat and flour exports go to the United Kingdom. A great deal of United States wheat goes down the St. Lawrence on the way to Europe, but few breadstuffs are sent into Canada for consumption there. Maize and oats are large export crops in the eastern provinces. Oats, barley, and rye, being hardier than wheat, thrive north of the wheat belt on the central prairies as well as in Ontario and Quebec.

The southeastern part of Ontario, nearly surrounded by the Great Lakes, is the garden of Canada. The southern counties produce the choicest fruits, including grapes for wine and table use. More than one third of the apples imported by the United Kingdom come from the orchards of Ontario and Nova Scotia.

Animal industries are mainly centered in the eastern provinces. As Manitoba has grown in wheat production, the farmers of Ontario and the maritime provinces have turned their attention more largely to dairying, wool, and the raising of horses, cattle, and sheep for the British market. Canada supplies about one third of the horses imported into British cities for omnibus, cab, and other traction. Live cattle sent to Great Britain for slaughter are worth about five times as much per annum as the exports of horses (p. 194); but Canada has as yet only a small part in the dressed-beef trade, which is so large a feature of exports in the United States, Argentina, and Australasia. While Ontario is the largest cattle grower, the ranches of Alberta, watered by streams from the Rocky Mountains and covered with bunch and buffalo grasses that are nutritious, even when sear and yellow in winter, are raising thousands of cattle for export or for sale to the new mining towns in British Columbia. The export of dressed poultry in cold storage is a growing industry. Thousands of chickens and turkeys from Canada are kept frozen in British cities for weeks before they are consumed.

Canada is the largest exporter of cheese in the world (p. 194). Cheese making is carried on mainly in Ontario. Four-fifths of the product of nearly 4,000 factories is sent to Great Britain. These factories have so high a reputation for prime, uniform products, that the United Kingdom takes three-fourths of its cheese imports from Canada. Canadian butter also brings a high price in British markets.

The fisheries are among the largest in the world (p. 92). About 90,000 men are employed in them. The most valuable are those of the Atlantic coast. The Labrador current brings to the shallow waters of the coasts and banks billions of algæ, that are the food of the cod, mackerel, shad, haddock, and halibut (Fig. 50). As hundreds of vessels sail from France, the United States, and other countries to share this sea wealth, Canada maintains a fleet of cruisers

to enforce observance of the three-mile limit and other fishing regulations (p. 83). The lobster fisheries along the coast of Canada and Newfoundland are the most productive in the world. The catch of Nova Scotia, about one-third of the total product, is mainly cod, lobsters, and herring. New Brunswick, the third largest producer, catches more herring than all the rest of Canada and sells most of the product in the United States. On account of our tariff on fish-food preparations the New Brunswick herring are sent to Eastport, Me., where nearly forty factories can them as sardines (p. 86).

British Columbia contributes about one-fourth of the fishery products, nearly all salmon, a small species (best for canning) with firm flesh and rich red color. It spawns chiefly in remote lakes near the headwaters of the principal rivers. It is canned in large quantities on these rivers, and most extensively on the Fraser River. A different species of salmon, caught in streams tributary to the St. Lawrence, is identical with the salmon of British rivers.

As the lakes and rivers abound in fish, the inland fisheries are very productive as well as those of the sea. The fisheries of the Great Lakes, consisting mainly of whitefish, trout, herring, sturgeon, bass, and pickerel, chiefly carried on in Lake Huron, yield about one-twelfth of the entire product.

The total value of the fisheries is about $25,000,000 a year, half of which is exported, mainly cod, salmon, lobster, and herring. Great Britain and the United States buy three-fourths of the exports, but canned salmon is sent to many countries, and large quantities of cured cod to Roman Catholic lands and, most of all, to the West Indies. The Atlantic coast fisheries have the advantage of easier access to the British, New York, and Boston markets, and also to ice supplies, which are essential in the shipment of fresh fish; but the pursuit of halibut, cod, and herring

along the Pacific coast is greatly facilitated by the comparatively smooth water there.

Canada is one of the largest producers of furs (p. 88). This business, excepting sealskins, is monopolized by the Hudson Bay Company, with headquarters at Winnipeg. The hunters and trappers of the company, many of them Indians, are scattered all over the northern forests and waste lands. Edmonton is the chief center for the dispatch of hunting and trapping parties. The furs and skins, baled at Winnipeg, are most of them sent up the Red River into the United States for export.* Pelagic sealing (killing seal at sea while on their way to or from their breeding grounds) was long carried on by British Columbian sealers with great profit. In this way 44,086 skins were taken in 1894. As the industry threatened the extermination of the fur seal, pelagic sealing was prohibited by the United States and Great Britain.

Canada has a larger forest area than any other lumber-producing country (p. 114). The subarctic forest belt, 200 to 300 miles wide, stretching across the continent from Labrador to Alaska, contains enormous quantities of spruce and poplar adapted for wood pulp. This forest belt can not be utilized till railroads reach it. In the east, the subarctic forest merges into the region of pines, spruce, poplar, and hardwoods that make Ontario, Quebec, and New Brunswick the largest sources of lumber and pulp wood in the country.

New Brunswick, whose most valuable woods are pine, hemlock, and maple, is more completely a lumber province than any other, but the largest lumber product comes from Ontario. Ottawa, drawing its supplies of red and white

*The chief product in 1894 was: Beaver, 46,779; otter, 7,455; mink, 51,163; marten, 108,997; lynx, 12,813 (78,555 in 1888); bear, 9,173; musk rat, 648,687. The yield has been decreasing owing to reckless hunting. The otter, yielding one of the most valuable of furs, is nearly exterminated.

pine from the regions west, north, and east of it, is the greatest center of lumber manufactories. Millions of logs, floated down the Ottawa and other rivers, are turned into lumber in the sawmills at Chaudière Falls, near the city. The product is sent by river and canal to Montreal, or by rail to the Great Lakes. Deseronto, on Lake Ontario, is the second largest center of lumber making in the province. Oak, maple, elm, and other hardwoods are important in the lumber output of Quebec, and the city of Quebec is the largest center of the lumber trade in that province. Hemlock forests and cattle growing on widespread pasture lands have made leather tanning an important industry at Quebec and Fredericton, N. B. The paper mills of New York and Maine draw considerable supplies of wood pulp and pulp wood from the spruce-growing provinces.

The coniferous forests of British Columbia are of vast extent. Eighty-five per cent of the output from the mills is Douglas fir, a tough, strong timber well suited for masts and building purposes.

Canada exports three fifths of her forest products. Quebec, Nova Scotia, and New Brunswick send the larger part of their lumber exports to the United Kingdom, but nearly all the exports of Ontario cross the Great Lakes into the United States. No other countries buy important quantities.

Gold is a large mineral product. Canada had become fifth among the gold-producing countries in 1897, owing to the large mining development on the Yukon and in British Columbia (Fig. 68). The placer-gold yield of the Klondike (Yukon) increased from $2,500,000 in 1897 to $16,000,000 in 1899; but the total product has now greatly declined. The British Columbia fields are largely grouped along the Fraser and Columbia Rivers, particularly in the Cariboo district of the north and the Kootenai section of the southeast. Gold mining has also come into prominence near Lake of the Woods in West Ontario and

in Nova Scotia. A great deal of gold bullion is exported to the United States and Great Britain.

Coal is the largest mineral product. The value of the output in 1907 was over $26,000,000 (Fig. 81). Coal outcrops (bituminous) are found along the shores both of the Atlantic and Pacific, and coal measures underlie large areas of the interior plains; but mining is carried on only where transportation is at hand, as at Nanaimo and Comox, on Vancouver Island, and on the Queen Charlotte Islands, these British Columbia mines supplying nearly half the output; and at Lethbridge, in Alberta, reached by a branch road from the Canadian Pacific, coal from which is exported to mining centers in Montana. The Nova Scotia fields along the north side of the peninsula, and those on Cape Breton Island, near Sydney, produce excellent steam coal, which is of great advantage to the shipping. Anthracite of good quality has been found in Alberta, near the Rocky Mountains, and in the Queen Charlotte Islands.

The presence of iron ore in Nova Scotia, at Bell Isle, N. F. (Conception Bay), and in some coast districts of Quebec, near abundant supplies of coal and limestone, is developing iron industries at New Glasgow, Truro, and Londonderry, N. S., Sydney, C. B., and some other points (Fig. 81). The government pays a bounty on every ton of pig iron produced.

Nearly half the world's supply of nickel comes from the Sudbury district in Ontario (p. 136). A sufficient quantity has been located there to supply the world for a century at the present rate of production. The largest copper deposits are in the neighborhood of Sudbury; rich copper ores, have long been mined near Algoma, on the northeast shores of Lake Huron. Native copper, such as has been so profitably mined in the Keweenaw Peninsula (p. 129), is found along the Canadian shores of Lake Superior and also in various parts of British Columbia. The mines among the gold fields of Rossland (Fig. 81) pro-

duce three fourths of all the copper mined in Canada, making British Columbia the largest exporter. The largest development of Canada's vast mineral resources will be in the future.

Ontario and Quebec are foremost in manufactures. Although Canada is mainly a producer of raw materials, manufactures have made large progress in the past twenty-five years, protected as they are by high tariff duties. Industries suffer to some extent (1) from the fact that the United States pays higher wages and thus attracts many of the best workmen, and (2) because the population is still too small to make a large home demand. Still Canada exports many articles, as agricultural implements, cheap cottons, woolens and clothing, leather, shoes, cutlery, beer, refined sugar, and, most of all, lumber and other forest products. Nearly all manufactures are growing, except the building of wooden ships—once a great industry in New Brunswick—which has declined with the introduction of iron and steel for ship building. Only the coarser kinds of textiles are made. Most of the manufactures exported go to the United States, Newfoundland, and the West Indies; but Great Britain is the largest market for Canadian leather.*

Commerce is promoted by a great inland waterway. From the Strait of Belle Isle, where steamers from the Atlantic enter the coastal waters, the distance to the head of navigation in Lake Superior is 2,384 miles. The Gulf, St. Lawrence and other rivers, and the lakes afford an almost unbroken waterway. Canada has expended $80,000,000 in

* The largest center of manufactures is Montreal, which produces refined sugar, leather and rubber goods, textiles, steel and iron wares, cigars, and many other articles. Quebec, near the largest leather-tanning districts, makes boots and shoes. Ottawa is preeminent for lumber. Kingston has cotton and woolen mills, and locomotive and car works. Toronto, Hamilton, and Windsor (opposite Detroit) are also large manufacturing centers.

constructing and improving canals along the St. Lawrence, where rapids impede navigation. Vessels drawing fourteen feet may now travel from Chicago or Duluth to European ports; but larger vessels on the Great Lakes take cargoes to the foot of Lake Erie, at the Welland Canal, where they are transferred to canal boats for Montreal, meeting ocean steamers at that point. The Saskatchewan, flowing to Hudson Bay, and the Mackenzie, emptying into the Arctic Ocean, afford 4,000 miles of navigable waterways in the far interior of the country. The Richelieu Canal to Lake Champlain from Montreal opens a water route to the Hudson River. Steamship lines connect Montreal with Liverpool, Belfast, Aberdeen, and Newcastle.*

A network of railroads connects Canada with the United States at many points. The Canadian Pacific railroad, completed in 1885, is the most direct route among American transcontinental lines for the trade between Europe and the Orient. Lines of Pacific steamers sail from Vancouver to Japan, China, and Australia.

Most of Canada's trade is with Great Britain and the United States (p. 193). Her trade with each country is nearly the same in amount, but very different in kind. We do not require many of Canada's raw materials, while the United Kingdom is a great market for them. Logs and lumber are the largest export to this country; metals, coal, fish, and furs are also important. On the other hand, the United States manufactures a great many commodities that Canada needs. It pays her merchants to buy them in spite of a preferential tariff in favor of Great Britain, by which the duties on British goods are one third less than those on imports from other countries. Thus Canada purchases many more commodities, mainly manufactures, from

* About 7,000 sailing vessels and steamers, with a net tonnage of over 700,000 tons, are owned in Canada.

the United States than from Great Britain; and sells many more commodities, mainly food stuffs, to Great Britain than to the United States. Canada buys from the United States nearly twice the value of the goods she sells to this country. She sells to Great Britain about three times the value of goods she buys from her.

Newfoundland is a British colony distinct from Canada. The basis of its industrial support is catching and curing fish. There is much good farming land in the west of the island and also in the valleys, but the surrounding sea is so rich in fish and seals that agriculture is neglected. Most of the population engage in cod, herring, and lobster fisheries or in killing the hair seal for its oil and skin, of which leather is made. Besides cured fish, the people produce cod-liver oil, glue from fish skins, and fertilizers from fish offal. Dried codfish, sent to the West Indies and the southern countries of Europe and America, is half the exports. Lobster canning also is a large industry. The imports, chiefly food and clothing, come from Canada, the United Kingdom, and the United States. St. John's, the capital, on a fine landlocked harbor, is wholly devoted to the fishing trade.

STATISTICS FOR CANADA

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS)

	1871–'75.	1881–'85.	1891–'95.	1898.	1909.
Exports	82.5	96.0	112.5	164.1	261.5
Imports	117.5	116.5	122.0	130.7	298.2

TRADE WITH LEADING COUNTRIES IN 1909 (IN MILLION DOLLARS)

	Exports.	Imports.		Exports.	Imports.
Great Britain	133.7	70.7	Germany	1.5	2.4
United States	92.6	180.0	France	3.2	8.2
West Indies	4.5	8.1	China and Japan	1.8	2.6
Newfoundland	3.5	1.6	Belgium	3.9	2.0
South America	3.5	....			

LEADING IMPORTS AND EXPORTS IN 1909 (IN MILLION DOLLARS)

Imports.		*Exports.*	
Iron and steel and manufactures	63.0	Forest products	44.7
Coal and coke	31.2	Wheat and flour	56.0
Woolens	21.0	Cheese	20.4
Sugar	11.4	Fish	9.6
Cottons	17.1	Cattle	10.8
Tea and coffee	4.3	Bacon	8.4
Silk and manufactures	4.8	Gold and other minerals	37.3
Raw wool	1.4	Coal	4.5

AVERAGE ANNUAL TRADE OF NEWFOUNDLAND (IN MILLION DOLLARS)

	1881–'85.	1890–'95.	1909.		1881–'85.	1890–'95.	1909
Exports	7.8	6.7	10.9	Imports	8.1	7.0	11.6

CHAPTER XIX

THE UNITED KINGDOM OF GREAT BRITAIN AND IRELAND

The position of the United Kingdom gives it exceptional advantages for foreign trade (Fig. 1). Located at the center of the northern or land hemisphere, within easy reach of the densely peopled countries of continental Europe and with good markets on all sides, it is splendidly situated for the conflict between the great commercial nations for supremacy. As it lies far north, the sunlight needed for crops continues up to seventeen hours a day in the chief growing months; while the persistent westerly winds blowing over a warm sea (anti-trades, Fig. 8) give the kingdom a temperate climate with abundant moisture. The United States and Canada, separated from it by the narrow part of the Atlantic, are its largest sources of food supply, and among the best markets for its manufactures. While the kingdom has only about 45,500,000 inhabitants, the British empire comprises nearly one fourth of the world's population, England's vast colonial possessions being of great advantage in promoting trade (pp. 30, 31).

England has the advantage of the equable sea climate (p. 7). This is most favorable for all its industries. The western highlands have a marked effect upon the climate, for they condense a large part of the vapor that the wet anti-trades bring to the land, so that the average rainfall at Plymouth in the west is forty inches while at London in the east is twenty-four inches a year; but although the high-

lands receive the larger amount of rainfall, that of the plain suffices for all industrial purposes. Across the plain important rivers flow gently eastward toward continental Europe with currents so slow that they are easily navigated and do not clog their estuaries with sand bars. These rivers, which have thus given rise to the great ports of the east coast, carry a large amount of commerce.

The highlands of the west of England produce the larger part of the manufactures; the level southeastern part of the country is the great agricultural tract. The higher lands are in the north and west, and the lower lands in the east and south. The sterile Scottish Highlands are the least productive areas, the poor soil and cold climate rendering agriculture almost impossible; many sheep, however, graze in the valleys where the scanty population lives; here, too, large forest districts are maintained as game preserves by men of wealth. The fertile Lowlands of Scotland, with their fields of oats and root crops, and a rich supply of coal yielded by their carboniferous strata, have attained large manufacturing importance. The highlands of west England, extending south of the Scottish Lowlands from near Berwick on the east coast to the English Channel at Exeter (Fig. 82), yield tin, iron, slate, lead, and copper, and most of the coal and salt. The larger part of the manufactures, except in the Leeds and Birmingham districts, are produced near the sea among these highlands. The whole of England east of the highlands—that is, the entire east and south of England—is a plain quite uniform in surface except where diversified by low chalk or limestone hills, a region of rich grass, wheat, and barley.

Ireland has highlands grouped along the coast, yielding granite, copper and other minerals; and a large central plain, with rich grasses, many lakes, and bogs that yield peat used for fuel. The plain is a region of grazing and root crops, particularly the potato, upon which the Irish rely so largely for food that the failure of the crop in 1846

FIG. 82.—The railroad system radiates from London in all directions to other ports or industrial centers; these in turn are centers of smaller systems of radiating lines; so that the country is covered with a network of railroads, all large towns being connected with all the others by one or more lines.

resulted in severe famine. The country is so poor in coal that its main reliance is agriculture and grazing. Its manufactures are grouped mainly on the east coast, where supplies of coal from Great Britain may easily be obtained.

No country excels the United Kingdom in shipping facilities (Fig. 82). All manufacturing centers are within fifty miles of a port. Most of the best harbors of Great Britain are on the estuaries, those of the east coast harbors being most favorably situated for trade with continental Europe, and those of the west coast for trade with America and the rest of the world.

The wearing away of the soft rocks on the east coast of England has widened the mouths of the rivers Tyne, Tees, Humber, and Thames into estuaries. Backed by rich coal measures, the Tyne is skirted for twelve miles by Newcastle and other large towns, which export great quantities of coal. The Tees, near whose mouth is Hartlepool, drains the greatest iron region in England—the Cleveland iron field. Both these rivers render transport to Germany and Scandinavia easy and cheap. The Humber, flowing from the central manufacturing districts through the farming lands of the east, gives Hull a large trade in agricultural products and manufactured goods, its trade with the Baltic being particularly large. The Thames, the most important river in England, is navigable for the largest vessels to London, the leading port of the world; it also has the commercial advantage of fronting the great continental ports of Amsterdam, Rotterdam, and Antwerp. On the south coast, Dover, Folkestone, and Newhaven have a large cross-channel passenger and freight trade, while Southampton, with steamship lines to all parts of the world, and Plymouth, with lines to the Orient, Australia, and America, are of much greater importance in international trade.

On the west coast, in the estuary of the Severn, are the harbors of Swansea, Cardiff, and Bristol—Swansea and Cardiff on a great coal field. These ports have great metal industries, owing to their proximity to coal and iron and the ease with which iron ore is imported, particularly from Spain. Cardiff exports more coal than any other port in the world. Milford is the finest natural harbor in England,

and is nearer to New York than any other, but it has not been developed. The estuary of the Mersey is between the coal fields of Lancashire and Wales and near the manufacturing center of England. This wealth of fuel, abundant industrial products, the miles of docks, and the splendid steamship connections with New York have made Liverpool the second greatest port in the country.

Glasgow, the chief port of Scotland, has three miles of docks and an artificial harbor, made by deepening and widening the river Clyde. The coal around it has made the city a great manufacturing center. Aberdeen on the Dee, at the opening of the valleys penetrating the mountains, commands the trade of north Scotland. Dundee on the Tay is so well situated for trade with Baltic ports that it has received most of the flax and hemp imports from Russia and north Germany; the jute trade also has been drawn to this port.

Most of the trade of Ireland is through Belfast, Dublin, Waterford, and Cork. Belfast's large industrial importance is due to its position on the Antrim iron field and its proximity to Scottish coal. Cork's landlocked harbor is on the route of transatlantic steamers. Limerick is most important in west Ireland; but the west coast ports, with mainly a pastoral region behind them, do little more than a coasting trade.

Agriculture is of subordinate importance (Fig. 83). There are more merchants than farmers, and five times as many

FIG. 83.—SUBDIVISIONS OF THE SOIL.

Most of the unproductive area is among the Highlands of Scotland. Hay and pasture lands have expanded in England at the expense of the tilled lands.

workers in mines, factories, and shops as there are tillers of the soil (Fig. 84). The farmer has great home markets; but he labors under the disadvantage of high rents and

transportation charges, heavy expense for fertilizers, and competition with the cheaper farm products of America and Australasia; still Great Britain produces more per

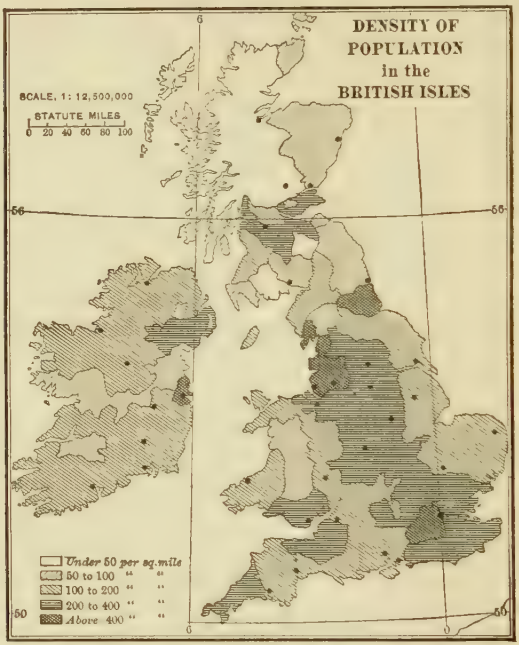

FIG. 84.—The most densely peopled regions are on the coal fields and near them, where most of the manufacturing industries are situated.

acre of every staple food suited to her soil and climate than any other country in the world. As the kingdom has a greater population, in proportion to the cultivable area, than any other nation of Europe, it is impossible to provide the food required without importations so large that the United Kingdom, with its 45,500,000 people, is the largest buyer of foreign foods. Because the United States, Canada, India, and Argentina raise cheap wheat and send it cheaply across the ocean, the price of wheat in

England has fallen half in twenty years, and the profits of wheat-raising on British farms have become so small that

FIG. 85.—The drier and lower lands of the east and southeast of England are the chief wheat-growing area. Most of the barley is grown in this wheat region. Oats flourish better in the cool, moist regions of the west and north. Pastures and root crops for stock raising cover large areas. Hops for beer making are grown mainly in the south of England. Compare Fig. 85 with Fig. 86 to trace the relations between the distribution of the manufacturing industries and of the coal fields.

the home industry is constantly decreasing (Fig. 85). The imports have grown 70 per cent. in a quarter of a century. Three fifths of the import wheat and flour, in 1900, came from the United States, but we have now less wheat to sell abroad, for we need more at home. Oats holds the first place in acreage, but is also largely imported from the United States, Russia, and Canada. Maize, which is also of large importance in animal feeding, does not mature in the country, hence the entire supply is imported from our corn belt, mainly through New York and New Orleans. Of barley, a flourishing crop is supplied to the breweries and distilleries of Burton, Strathmore, and other regions, but large quantities are imported from Russia, Anatolia, and the United States. Rice is brought from Burma and Bengal.

Domestic animals supply only a part of the demand for meat and dairy products. Many millions of dollars are expended every year in the purchase of foreign meat, which is brought in alive, or in the form of dressed carcasses, or as preserved meat. The richest meadows are in Ireland and west England, where rainfall is largest; so the most cattle, in proportion to area, are found in these regions, though they are widely distributed, being least numerous in Scotland. In Ireland, where there are comparatively few large towns, more attention is paid to exporting butter to England than to selling milk, while England, selling milk to domestic consumers, must needs buy great supplies of butter, mainly from Denmark, but also from Holland, France, and even from Australia and Canada. English cheeses are among the finest in the world, but many are imported (p. 186). Breeds of large cattle, raised everywhere for beef, are stall-fed for the market. Live cattle and beef products come mainly from the United States, Canada, and Argentina. Sheep are raised most extensively in the drier east, the country being noted both for the variety of excellent wools, and also for the superior mutton which it produces. Frozen mutton, selling at a

lower price than the home-grown article, is imported in enormous quantities from Australia, New Zealand, and Argentina. Hogs, raised all over the country, are also in insufficient supply, and hams and bacon, from this country and to some extent from Denmark, are very important food supplies. The country is the largest importer of poultry and eggs in the world.* Many European countries send poultry, even Italy contributing chickens and turkeys, while important supplies come from Canada.

Many fishery products are exported and few are imported (Fig. 85). Over 100,000 men are engaged in the fishing industries, fish being the only food product yielded by the country in adequate supply. The sea fisheries are more valuable than those of any other country except the United States (p. 92). They extend all around the coasts and throughout the North Sea (Fig. 51). All the coast towns are fishing ports, but some of them are specially important (Fig. 82), as Hull, Yarmouth, Lowestoft, Grimsby, and Harwich on the east coast, and Dartmouth on the south coast, from which fleets of sail and steam trawlers and other fishing vessels are sent. Many of these vessels have tanks in which the fish are kept alive till the vessels return, or the fish are transferred to fast vessels which take them to port, whence they are distributed by special trains to all the large cities. Haddock, cod, herring, and mackerel are most important; trawlers have developed a large market for the sole, flounder, and other flat fish. The cod is sought on the Dogger Bank in winter and on the east side of the North Sea in summer; not a few British vessels also visit the cod-fishing grounds of Iceland. Herring is the great staple of the Scottish fisheries, but in winter the herring fisheries extend as far south as the English Channel, where also

* In 1909 eggs worth $35,000,000 were imported. Most of the supply comes from Russia. Many Danish eggs, exported through co-operative societies, are marked on the shell with a stamp so that the persons supplying them may be identified if the article is inferior.

mackerel fishing is very important. The English fisheries being nearer to the great markets than those of Scotland are much more valuable in the home trade. The herring is the great fish of export, about $10,000,000 worth a year being pickled and sent to the Greek and Roman Catholic countries of Europe. The home supply of all kinds is so abundant that the imports are small, except canned and frozen salmon, and lobsters from Canada; oysters from the United States and France; sardines from France and Portugal, and anchovies from Italy and Norway.

Flax and wool are the only fibers produced in the country. The cultivation of flax is mainly confined to the north of Ireland, supplying much of the material for the large linen industries of that island; the home supply, however, is quite inadequate, and about 80,000 tons a year are imported from the Baltic countries, chiefly Russia, and 20,000 tons of a finer quality from the south of Belgium (p. 102). A great deal of wool is grown, but much more is manufactured, nearly 350,000,000 pounds being imported every year to supply the deficiency. The main import is from the downs of Australia, the Canterbury plains of New Zealand, and the semiarid plains of Cape Colony. South African wool is less in demand, because the manufacturer has to pay the cost of cleaning; for this reason, also, little wool is imported from Argentina. Although the country does not raise enough wool for her own needs, large quantities are sold to other lands.

Cotton, hemp, jute, silk, and some other fibers are all of foreign origin. Great Britain consumes nearly two fifths of the world's supply of raw cotton, most of which comes from the United States (p. 105). The delta of the Nile also sends much Egyptian cotton from Alexandria, the Deccan of India from Bombay, Cyprus and Anatolia from Smyrna; and Brazil, shipping from Rio de Janeiro and Pernambuco, also sends important supplies. Cotton is the largest import except breadstuffs.

With the growth of the cotton and woolen industries silk manufactures have declined in importance. The silk mills, however, annually work up about $10,000,000 worth of raw and thrown silk, imported mainly from France, China, and India. Jute, shipped from Calcutta to the amount of about 350,000 tons, supplies the factories of Dundee, Scotland, and the neighboring towns, which nearly monopolize the industry. Hemp is brought from Russia and Germany, and a great deal of cordage is made in towns all round the coasts, where the shipping is the largest purchaser.

Nearly all the timber is imported. The native hardwoods have been so far depleted as to count for little in the lumber supply.* The timber imports are exceeded in value only by the breadstuffs, meat, cotton, and wool. Pine and other building lumber are mainly imported from Norway, Sweden, Russia, Canada, and the United States; Germany and America supply oak, walnut, and maple. Mahogany, mainly from Africa and British Honduras, is the largest import of furniture woods. A great deal of oak for wagons is imported, and expensive rosewood and other tropical hardwoods for cabinet purposes. Canada and Scandinavia send large quantities of wood pulp for paper making.

Coal, iron ore, and limestone occur near together. These essentials for producing iron and driving machinery made the kingdom a great manufacturing nation. The country mines all kinds of coal, sells about one sixth of the output to other countries, and uses the rest for manufacturing and domestic purposes. Each coal field has special lines of manufactures closely associated with it (Fig. 86). Iron ore is turned into pig iron from south Scotland to south Wales, the largest center of the trade being the Cleveland district

* Mulhall gives the value of the timber annually consumed in Europe, as $951,250,000; United States, $387,000,000. This authority says that gold and timber are almost the only articles that have not declined in value in the past fifteen years.

(Durham-Northumberland coal field), which produces 3,000,000 tons of pig iron and 1,250,000 tons of steel a year. The second largest source of pig iron lies mainly between the Cumberland and Lancashire coal fields, and

FIG. 86.—The Clyde coal field (1) is the center of the largest shipbuilding in the world, of locomotives, machinery, and all kinds of iron work, and of textile manufactures. Coal is exported to St. Petersburg, the Mediterranean, and the factories of Belfast and north Ireland; (2) much of the coal is used to smelt iron ore in Furness and to supply north Ireland; (3) large quantities are shipped to London and to many parts of the world, and also used in the great iron industries of Newcastle, Sunderland, and other cities; (4) very little exported, as nearly all is consumed in the textile, machinery, and chemical works of south Lancashire, or sold to steamers sailing from Liverpool and Manchester; (5) supplies the woolen district of Leeds and Bradford, the iron works of Sheffield, the lace, underwear, and hosiery factories of Nottingham, and the surplus is sent to London; (6) supplies fuel for the great center of iron manufactures in the Birmingham region, steam power for the pottery district, and sends much coal to London; (7) smelts many ores, including some that are imported, as copper from Chile, and red hematite (steel-making ore) from Spain; also exports coal through Cardiff to all parts of the world; (8) supplies the west of England woolen-manufacturing centers.

is the only important center of the superior hematite ores, which are the best for steel making. The iron region, in the Staffordshire coal field, received the name of the Black Country owing to the numerous forges and puddling fur-

MANUFACTURING INDUSTRIES.

LOOM ROOM, PONEMAH MILLS, TAFTVILLE, CONN.

naces in many towns before steel superseded wrought iron. British ore is not so rich in iron as that of our Lake Superior mines or those of Spain and Sweden, and the supply has so far diminished that large quantities are now imported, mainly the black iron ore from Sweden and the hematite of Spain. Most of these large imports are smelted in south Wales, the chief seat of the Bessemer steel industry. The growing expense of iron mining, the need for large imports of ore, and high freight charges in Great Britain are among the reasons why United States pig iron and steel have recently been sold in British markets in competition with the home products. The tin mines of Cornwall and Devon are the largest European sources of this metal (Fig. 66), but larger imports from the Malay peninsula are also required. Little copper is produced, but large quantities are imported from the United States, Australia, and Chile for the electrical industries. Enormous quantities of gold, silver, lead, zinc, mercury, and other metals and minerals are imported. The country abounds in limestone, sandstone, granite, and other building stones, slate for roofing, clay for brick making, and China clay (decayed granites) which is sent to the Staffordshire potteries (Fig. 87).

FIG. 87.—The headwaters of the Trent are known as the district of the potteries. The shaded areas show the location of the clays from which most of the china ware that England exports in large quantities is made. Much clay is also sent from other parts of the country.

Cotton spinning and weaving are the largest industries (Fig. 88). More than half of the entire exports consist of cotton, woolen, and other textiles. About 5,000,000 persons depend for their livelihood upon these industries. They are centered mainly in Lancashire, where the moist climate is peculiarly adapted for spinning.

South Scotland produces chiefly cotton thread at the Paisley works. Cotton yarn and cloth are sent to all parts of the world, but chiefly to the warmer countries where lighter weights are in demand, the value of the exports being more than that of the total woolen, iron, and steel exports. The cotton cloth these mills sell to other countries every year would extend ten times between the earth and the moon.

About two thirds of the woolen products are consumed at home (Fig. 88). Large quantities of fine English woolen and worsted goods, flannels, and blankets are sent to the

FIG. 88.—COTTON AND WOOLEN DISTRICTS.

Manchester is the great cotton market and distributing center, but manufactures very little. The larger part of the cotton textile districts are in south Lancashire. Spinning cotton yarn engages many thousands of operatives in Oldham, Blackburn, Bolton, Preston, Burnley, Rochdale, and Stockport. The largest weaving centers are Preston and Burnley, on the north of the Lancashire coal field, the finer goods being made at Preston and coarser fabrics at Burnley. The machinery used in the cotton mills is made on the Lancashire coal field at Oldham, Rochdale, Bury, and Manchester. Leeds and Bradford are the main centers of the woolen trade, and with the large towns near them make most of the woolen fabrics. The industry is largely specialized. Leeds and Huddersfield produce broadcloth; Halifax, flannel, rugs, and carpets; Bradford, alpaca, mohair, and woolen damasks. Woolen machinery is made at Bradford. Leeds and Barnsley are large producers of linen, drawing their fiber from the flax fields of Yorkshire and Russia. Coventry, Macclesfield, and other towns south of the cotton and woolen districts are the most important centers of silk weaving. Liverpool and Manchester, with its ship canal (p. 43), are the ports of the cotton and woolen districts.

cooler parts of the world, mainly north Europe, North America, Australia, and Argentina. Our high tariff on imported woolens has reduced the trade with the United States. A great deal of Scottish wool is made into cheviots and

tweeds. Kidderminster and Wilton are famous for carpets and Leicester for hosiery.*

Metal working is, after textiles, the most important industry. Great Britain is conspicuous for the quantity, excellence, and cheapness of its metal manufactures, but in recent years it has suffered from American and German competition, not a few iron and steel products from the United States being now sold even in British markets. The main center of iron and steel manufactures is in south Staffordshire, where all kinds of metal goods are turned out, from the railroad iron of the Birmingham district to the hardware of many small towns. On the Yorkshire-Derbyshire coal field the iron industries center around Sheffield, famous for its cutlery and tools; here all forms of iron and steel, including machinery, are produced. Leeds, on the north edge of this coal field, also produces many iron goods. The great works on the Durham-Northumberland coal field produce railroad plants, guns, and other articles.

About 1,000,000 tons of pig iron are exported every year. Railroad material, from rails to locomotives, is sent to many countries. Tin plate, a large product of south Wales, has lost much importance in the export trade owing to the development of the industry in the United States (p. 127). The export of metals and their manufactures to all parts of the world is nearly one fourth the total exports. No other country builds so many ships, in some years more than 1,000,000 tons of ships, mostly steam vessels, being launched from the great shipyards at Belfast and on the rivers Clyde, Wear, Tees, and Tyne. Many foreign orders for ships are filled in British yards.†

* About half the exports of the fine linen goods of Belfast, Leeds, and other centers are sent to the United States. The exports of silk goods are much smaller than the imports, manufactured silks being the only textile for which Great Britain is dependent to a large extent upon other countries. The exports of jute piece goods from Dundee and Glasgow is large.

† Among other important manufactures are the chemical indus-

Railroads are the chief means of internal transport (Fig. 82). Excellent wagon roads connect the farms with railroad stations. Though there are many canals and most of the rivers have been canalized, the carriage of freight by inland waterways is not so prevalent as in Belgium, Germany, and France. Besides the artificial ship canal to Manchester (p. 43), the lower parts of the Thames, Clyde, and Tyne may be regarded as great ship canals leading to ports some distance inland. They are kept deep enough to permit the passage of the largest vessels. The coast trade between the various ports is very important.

A large part of the world's trade is carried in British vessels (p. 48). The country is connected by steamships with all the important ports of other lands. The tonnage in the foreign trade entering and clearing at British ports every year is over 1,200,000,000 tons, of which only one ninth is sailing vessels. Seven out of every ten vessels entering the ports fly the British flag. Her pre-eminence on the sea adds much to the wealth of Great Britain, for it enables her to be a large freight and passenger carrier for other lands, and most of all for the United States. Three fifths of the British ocean trade, according to value, centers in London and Liverpool, where many docks have been built to accommodate sea commerce (Fig. 89).

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tries, producing aniline dyes, sulphuric acid, glass, soap, and other articles. The leather industries employ nearly 500,000 persons. Shoemaking is a great industry in Staffordshire, Leicestershire, and London. The country imports large quantities of leather and hides; leather and its manufactures, particularly boots, shoes, and saddlery, are sent abroad in large quantities. The manufacture of paper, with its principal centers in Maidstone, Manchester, and Bath, is noted for the quantity and quality of the product, but the demand is so great that much more paper is imported than exported. Beer is brewed most largely in London, Edinburgh, Dublin, and at Burton-on-Trent, whose neighboring hop fields and suitable water has made it celebrated for its product, which is exported to many parts of the world. Scotland and Ireland produce most of the whisky.

Most of the imports are foodstuffs and materials for manufacture; most of the exports are manufactures. One half of the British imports come from the colonies and the United States. Britons have become so dependent upon other people for foodstuffs that more than one third of all they buy abroad is food. In 1899 they spent for foreign food, raw materials, and manufactures $56.76 *per capita*, which was more per head of the population than the United States, France, and Germany spent together. The cotton, foodstuffs, and other things this country sells to Great Britain are one fourth of her total purchases. No other countries are so closely bound together by the magnitude of their commercial relations. England has a large trade in goods imported for re-exportation —a very profitable business for shipowners.

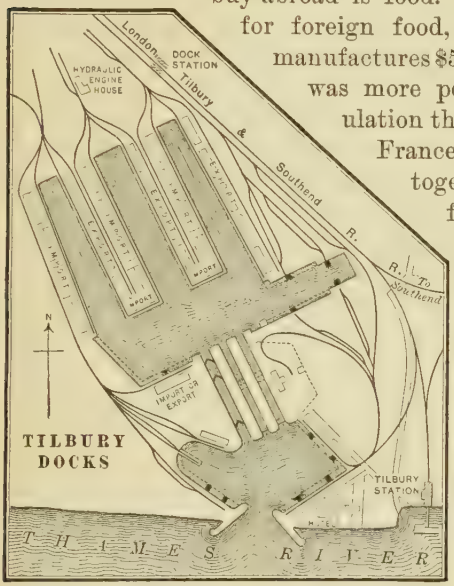

FIG. 89.—Most of the London docks surround water basins connected by channels with the Thames. Incoming vessels are moored at the import docks on which their cargoes are unloaded; they then receive cargoes from the export docks on the other side of them. Trains and trucks move down the middle of the docks, unloading export freight on one side of the tracks and loading with imports on the other.

Great Britain has a larger part in the world's trade than any other nation. It is the greatest market for food supplies and raw manufacturing materials sold by other countries. It is the largest source of manufactured commodities bought by other countries. Its bills for food and raw materials are

constantly increasing, and it must pay for its enormous purchases with the products of its mills. Because most of the things it buys are the necessities of life (food) and the necessities of industries (raw materials) it is a free-trade country, less than a score of articles being subject to duties. The trade of the United States with Great Britain is larger than with all the rest of the world, being 57 per cent of our total foreign commerce; 32 per cent of Great Britain's foreign trade is with this country.

Great Britain long held the highest rank among industrial nations. It is now surpassed, in value of manufactures produced, only by the United States. The United Kingdom, Germany, Belgium, and France acquired great industrial ascendancy after steam power was applied to manufacturing, because they mined most of the coal and iron, controlled good and cheap labor, and were most favorably situated in respect of large capital and facilities for transportation and commerce. The United States, having acquired similar advantages, now competes with the older industrial centers in the purchase of raw materials and the value of its industrial products.

STATISTICS OF THE UNITED KINGDOM

MEAN ANNUAL VALUE, 1907–'09, OF LEADING IMPORTS
(IN MILLION DOLLARS)

Grain and flour	385.0	Oil seeds	44.5
Cotton, raw	310.5	Fruits and hops	68.5
Wool and sheep	152.5	Eggs	35.5
Dead meat	208.5	Coffee	11.0
Sugar, raw and refined	101.0	Tobacco	24.0
Butter and margarine	125.5	Leather, dressed hides, etc.	46.0
Wood and timber	125.0	Wine	18.5
Silk manufactures	61.5	Cheese	34.0
Flax, hemp, and jute	66.0	Copper ore and manufactures	53.5
Tea	55.0	Iron ore and manufactures	65.5
Wool manufactures and yarn	33.0	Lead	16.5
Animals (for food)	34.0	Tin	32.5
Petroleum	31.5	Zinc and manufactures	13.0
Chemicals, dyestuffs, etc.	87.0	Machinery	23.5

MEAN ANNUAL VALUE, 1907–'09, OF LEADING EXPORTS OF HOME PRODUCE (IN MILLION DOLLARS)

Cotton manufactures	494.5	Iron and steel	207.0
Woolen and worsted manufactures	155.6	Hardware and cutlery	29.0
Linen manufactures	34.2	Copper	18.5
Jute manufactures	13.0	Machinery	151.0
Apparel and haberdashery	47.0	Coal, etc	201.0
		Chemicals	83.0

FOREIGN TRADE IN 1908 (IN MILLION DOLLARS) *

	Imports.	Exports.		Imports.	Exports.
United States	620.5	212.5	Norway	32.5	20.0
France	240.0	158.5	China	15.0	46.0
Germany	190.0	235.5	Japan	14.5	89.1
Netherlands	181.5	79.0	Portugal	14.5	12.0
Austria-Hungary	6.5	21.5	Chile	36.5	19.5
India	145.0	114.5	Rumania	17.0	9.5
Australasia	218.0	158.0	Greece	9.5	9.5
Belgium	135.5	58.0	Java	4.9	15.0
British North America	132.5	63.0	Peru	12.0	6.5
Russia	140.5	63.0	Philippine Islands	8.3	5.2
Cape Colony	30.0	40.0	Mexico	9.5	5.1
Spain	66.5	26.0	Central America	6.5	5.1
Denmark	97.0	23.0	Ecuador	7.5	2.4
Sweden	51.5	31.5	Total British possessions	649.0	728.5
Argentina	178.5	82.0	Total foreign countries	2,315.5	1,256.7
Egypt	87.5	47.5	Grand total	2,964.5	1,985.2
Turkish Empire	24.5	34.0			
Brazil	34.5	40.5			
Italy	17.0	75.0			

Imports in 1910, $3,123,524,785; exports, $1,890,901,735.

The monetary standard is gold, with the pound sterling (value $4.86\frac{3}{5}$) as the unit of coinage. Most weights and measures as in the United States. Cwt. (hundredweight) = 112 pounds.

* Exports special and imports general trade. Special trade is the import of articles for home consumption and exports of native raw or manufactured products. General trade includes the total trade, or, in other words, both the special and the forwarding trade. British figures for the import special trade are not procurable.

CHAPTER XX

GERMANY

No other country is in such close touch with so many great commercial nations. Germany is the most central country of Europe, adjoining Russia on the east, Austria-Hungary and Switzerland on the south, France, Belgium, and the Netherlands on the west, and Denmark on the north, while the British markets are accessible by a day's journey from German ports on the North Sea. The southern half is highland, and the northern half low plain, the country sloping toward the north. In the extreme south are the Alps and the high plateaus of the Alpine foreland, with the least genial climate and the smallest variety of vegetation. Between the Danube and south Prussia are the Central High Plains, the most fertile part of Germany except the Rhine and some other valleys. Nearly all of Prussia, half of the empire, is a sandy plain made highly productive only by the most scientific agriculture.

The continental climate prevails in the east, where the average temperature, therefore, is considerably lower than in the west. The westerly winds from the Atlantic (Fig. 8) give western Germany a mild climate in winter, while unbroken frost prevails in the east. South Germany derives no climatic advantage from its more southerly position on account of its high elevation. The rainfall is everywhere abundant.

The North Sea and Baltic Sea coasts extend for 1,200 miles (Fig. 90). The coast waters are shallow, and there are few harbors except at the mouths of rivers or some dis-

tance inland, where the river currents have worn deep channels. Hamburg is the third largest port in the world (Fig. 91), being surpassed only by New York and Antwerp. With a movement of 21,900,000 tons a year, it is the sec-

FIG. 90.—The Rhine, Weser, Elbe, Oder, and Vistula (Weichsel), all with large seaports at or near their mouths, carry on steamboats an enormous amount of commerce derived not only from their valleys, but also from many canalized tributaries and canals. The most western and the largest commerce carrier is the Rhine, which neither begins nor ends in Germany. Observe that the parts of these rivers navigable for large boats extend entirely across the empire or far into it. The North Sea ports are open all the year round, but the Baltic ports are frozen over in winter; Lübeck and Stettin, however, are kept open by ice breakers. Cuxhaven is the outport of Hamburg and Bremerhaven of Bremen. Kiel and Wilhelmshaven are naval ports. The population is most dense on the coal and iron fields, where industries are most active, and in the fertile Rhine valley, which is crowded with manufacturing towns. It is least dense in the low-lying agricultural and stock-raising regions of Prussia and in some of the mountain districts.

ond port of continental Europe. At high tide the largest vessels ascend the Elbe sixty miles to the port, where freight is transferred from steamships to Elbe boats that carry it nearly to Prague in Bohemia (Fig. 90). Hamburg handles nearly one half of the exterior commerce.

Bremen, fifty miles up the Weser, is the nearest port to the Atlantic, but on account of the shallow approach much of its business is done at Bremerhaven. Hamburg and Bremen gained their supremacy on account of their position in front of the peninsula of Jutland, which, before the building of the Kaiser Wilhelm Canal (Fig. 25), intercepted entrance

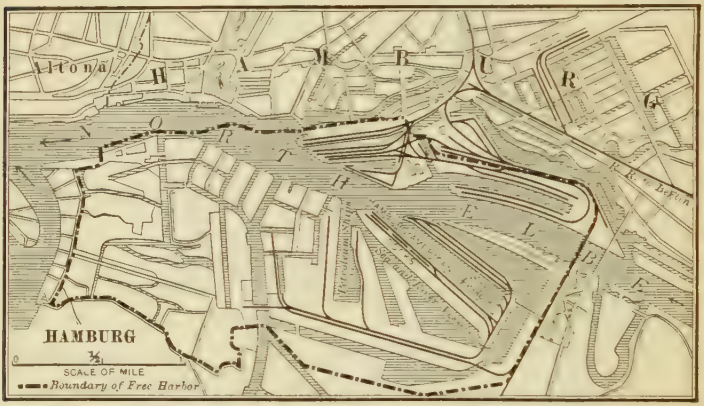

FIG. 91.—THE FREE PORT OF HAMBURG.

Two thousand five hundred acres of land and water in the harbor form the free port. Free ports serve in part the same purpose that our bonded warehouses do. Goods may be sent to bonded warehouses and forwarded later in bond to their destination in a foreign country without paying duties. In the same way goods sent to the free ports of Germany and Denmark do not come under the supervision of the customs laws. But if they are taken from the free port for consumption in the country to which the free port belongs, they must pay duties. The free ports are Hamburg, Bremen, Cuxhaven, and Danzig in Germany, and Copenhagen in Denmark. Hamburg's navigation and the industrial activity of its suburb, Altona, are closely related.

into the Baltic and made these river ports the natural place for unloading merchandise consigned to German ports from all parts of the world. Stettin, on the Oder, the nearest port to Berlin, has good water communications nearly to the Austrian frontier.*

* Danzig and Königsberg are large outlets for the cereals of northeast Prussia, and import much tea from Russia. Lübeck receives a great deal of petroleum from Russia, lumber and grain from Russia

German rivers and canals have large economic importance (Fig. 90). The length of waterways in France is greater than in Germany, but double the tonnage is transported by boat in the latter country. At many points along the rivers and canals, manufactured products of neighboring mills are shipped to sea ports, and large quantities of foreign goods are distributed through the interior by river vessels and canal boats. The fleets of the Elbe and the rivers and canals tributary to it, for instance, nourish both Hamburg commerce and the interior industries. Nearly one half of the Elbe traffic toward Hamburg is sugar. Heavy wooden boats have been replaced on the canals by steel lighters of large tonnage and small draught. All the large rivers are connected with one another, and also with the water systems of France, Belgium, and the Netherlands, by canals, so that freight on the Vistula, for example, may be carried by internal waterways to Paris, Antwerp, and Rotterdam. The Danube has through trade with North Germany by means of the Ludwig Canal, connecting it with the Main-Rhine.

Less than half of the population live on the farms. Seventy years ago four fifths of the inhabitants were farmers,

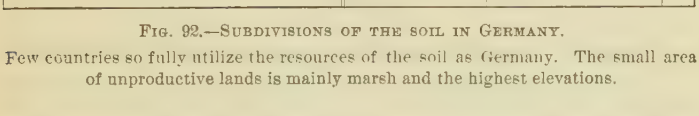

FIG. 92.—SUBDIVISIONS OF THE SOIL IN GERMANY.

Few countries so fully utilize the resources of the soil as Germany. The small area of unproductive lands is mainly marsh and the highest elevations.

but Germany has become more a manufacturing than an agricultural country. All available land is used for tillage and pasture (Fig. 92), but, like Great Britain, the country

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and Scandinavia, and sends manufactures to the same countries. Stettin brings in large quantities of grain and timber from north Russia, and herring from north European fisheries. Its largest export is sugar. Emden, opened to large ships (1891), is nearest the Atlantic.

can not raise the foodstuffs required. The best soil and climate for farming purposes are in the Rhine valley. Rye, the most important grain, because so large a part of the people eat rye bread, and potatoes, the largest food resource of the peasantry, are grown all over the sandy plain. Germany raises more potatoes than any other country, and has

Fig. 93.

a small surplus for export. The rye harvest is twice as large as the wheat crop; most of the wheat and barley are raised on the highlands of the southwest. Oats is a very large crop in most parts of the empire. The warm, sunny climate of the southwest is particularly favorable for wine, hops, and tobacco* (Fig. 93). One eighth of the bread-

* The light wines of the Rhine and Moselle, which flows into the Rhine at Koblenz, are celebrated, but the exports are small compared with the imports, chiefly from France. Tobacco growing is important, but the country, consuming about four pounds *per capita* a year, im-

IRRIGATION OF SUGAR BEETS.

stuffs is imported, Russia supplying most of the rye, while Russia, Rumania, and Argentina compete with the United States in furnishing wheat and flour. About half the money that Germany spends abroad is for foodstuffs.

About one fourth of the world's sugar is German beet sugar (Fig. 94). The sugar beet is the largest industrial staple of the empire. The industry is encouraged by sugar bounties. As the Germans are small consumers (using only one third as much sugar *per capita* as the people of Great Britain and the United States) more than half the crop, refined or raw, is exported. A considerable amount of the raw product is refined in the United States. The sugar beet and potato are sold largely to distillers in the northeast of Germany for the manufacture of spirits.

Pasturage is scattered all over the country (Fig. 94). Only Russia has a larger number of cattle. Large quantities of dairy products are exported. As a moist climate and wet soil favor the growth of grass, cattle and horse raising is the leading industry in Schleswig-Holstein and on the marshy lands of the North Sea coast. The high plains of the southwest also are rich in meadows, and raise fine cattle. The best saddle horses come from northeast Prussia; the industry is specially encouraged by the Government on account of its need for cavalry horses. Sheep have greatly decreased (nearly 6,000,000 in ten years) owing to the decline in the price of wool and the conversion of pastures into plowed lands to raise food for the rapidly growing industrial towns.* Very large wool imports (about

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ports from the United States far more than it raises. The hops of Bavaria, of superior quality, have given Bavarian beer its high repute. Flax and hemp are large imports from Russia, as the home supply for linen and cordage is insufficient.

* The finest wool raised in Saxony and Silesia is manufactured in the mills at Chemnitz, Görlitz, Breslau, and other wool centers. Large flocks are now found only on the big landed estates in the eastern part of Prussia.

$70,000,000 a year) come principally from the Rio de la Plata countries, Australia, and Cape Colony. Many hogs are fattened in the oak and beech forests of the south. The

FIG. 94.—The larger part of the beet crop is grown on the plains of Prussia and in the basin of the Rhine. As most sugar is made where most beets are grown, the largest centers of the industry are in the lowlands around the Harz Mountains and in southeast Prussia (Silesia).

The coal fields are near large navigable rivers, and their product thus has the advantage of cheap water transportation. The coal of the Rhine lies in the valleys of its tributaries, the Ruhr and the Saar. The coal of the Elbe is mined both in the kingdom and the Prussian province of Saxony. The coal of the Oder is found in Silesia. Great quantities of lignite (intermediate between peat and coal) are also mined for use mainly in sugar refineries and distilleries.

famous Westphalian hams come from the grain lands of north Westphalia, where hogs are bred so as to make the meat tender and least fat. The imports of meat are from $10,000,000 to $20,000,000 a year. The United States supplies about half of it, mainly hog products, Holland and

Denmark providing most of the remainder. The North Sea and Baltic fisheries employ thousands of men, though the industry is inferior to that of France. Many coast towns are engaged in fish curing.

Forests cover a fourth of the area (Fig. 92). Beech, oak, walnut, pine, spruce, and birch are among the most important varieties. The northern plains are poor in timber, but the highlands of the south are rich in this resource. In some parts of Bavaria the wood industries are almost the sole resource of the people; wooden toy making is a great industry in Nuremberg and in scores of smaller towns; large quantities of timber are floated down the rivers for lumber making. The state governments maintain strict supervision over the forest industries. No one may destroy a tree without planting another; thus the gathering of a crop of timber goes hand in hand with raising another crop. Considerable lumber is imported, chiefly from the Baltic countries and the United States, our contributions being mainly pitch pine, oak staves for beer and wine casks, and black walnut for furniture. The fruits of the cooler countries are raised, but many apples are imported from the United States.

Coal and iron are near together (Fig. 94). The German output of these minerals is far larger than that of any other country of Europe, excepting Great Britain (Figs. 58 and 61). The Ruhr coal field is the richest in Europe; on it are grouped the largest metal-working industries of the empire. Some iron is obtained on the field, but most is brought from the Harz Mountains, the headwaters of the Sieg and Lahn, and from the vast sources of iron ore in Alsace-Lorraine and Luxemburg. The coal of Waldenburg and Upper Silesia, second in importance, supplies Berlin and many other industrial cities with fuel and is also used in smelting the iron ore of Silesia. The coal of Saxony borders the Erzgebirge (ore mountains), which supply only a small part of the iron consumed in the Saxon metal indus-

tries. About two thirds of the iron comes from the apparently inexhaustible mines of Alsace-Lorraine and Luxemburg; considerable quantities of the superior steel ores of Spain and Sweden, and also American pig iron, are imported. The low cost for transport of coal, ore, and metal products is a great advantage. The steel made on the Ruhr coal field is hauled to the wharves at Antwerp, 150 miles, for 82 cents a ton.

Five sixths of the zinc comes from Upper Silesia (Königshütte), the world's largest source of zinc. Germany mines a great deal of copper, and more silver than any other country in Europe, both metals coming from the Erz and Harz Mountains. A vast supply of salt is mined on the north German plain. The world's chief source of lithographic stone is Solnhofen in Bavaria.

Germany holds the third place among manufacturing nations. She is surpassed in this respect only by the United States and Great Britain. Manufactures, employing a third of the people, have the advantage of a home market protected by high duties, the best technical skill, cheap transportation, disciplined labor, and great success in creating foreign markets.

Iron and steel and their manufactures are most important. They employ more men and turn out a larger value of product than any other industry. The largest centers are on the coal fields of the Ruhr and Saxony; in Alsace-Lorraine, which uses the coal of the Saar to smelt its iron ore; and in Thuringia and Bavaria, which bring coal to their iron mines. Iron and steel are also sent to many machine shops, far from the coal fields, for conversion into a great variety of articles. The wonderful development of the Rhine-Westphalia industrial region (Ruhr coal field, Fig. 95) has done much to make the economic greatness of Germany. Though the country makes most of its machinery, its imports from the United States and Great Britain are important. Thirty-five years ago Germany bought all its

locomotives in Belgium and England, but to-day its locomotives, made in Berlin, Chemnitz, Mülhausen, and other

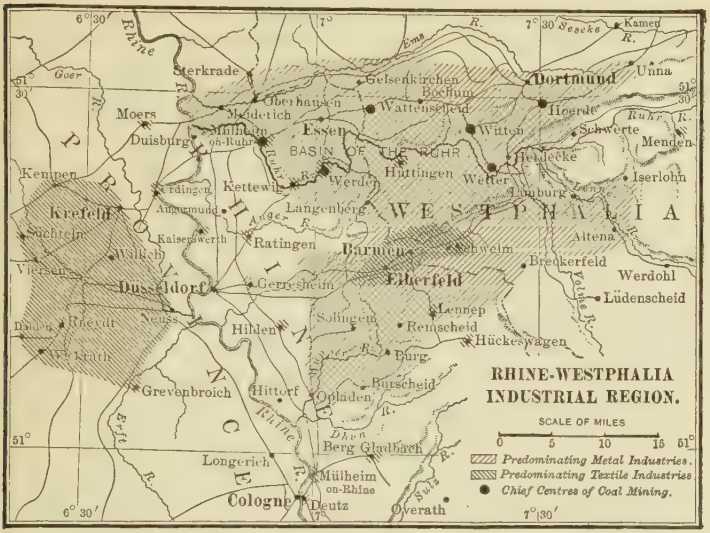

FIG. 95.—At Essen are the Krupp iron and steel works, the largest in the world, employing over 40,000 men and producing cast steel, railroad iron, cannon, and many other articles. Many of the towns on this map have now ten times their population of fifty years ago, owing to the concentration in them of metal industries. Remscheid and Solingen are renowned for side arms and cutlery. Iserlohn is famous for its needle factories; many other towns have their special products. Dortmund is a great shipping point for coal. Duisburg is the shipping point for coal on Rhine boats.

The double city of Barmen-Elberfeld, known as "the German Manchester," is one of the largest cotton-manufacturing centers of Europe. The region between Krefeld and Neuss is the center of the German silk and ribbon industry, and Krefeld has properly been called "the German Lyons"; its trade has recently languished owing to the decline of exports to the United States.

cities, are sold in many countries. Russia is the largest buyer of German machines.

Textile products are second in importance. Fibers are imported in large quantities, and, next to Great Britain, Germany is our best customer for raw cotton, which is the leading textile product. Cotton is distributed from Rhine

boats to spinning and weaving centers along the river from Elberfeld, Cologne, and Düsseldorf (Rhineland-Westphalia, Fig. 95) to Mülhausen (Alsace, Fig. 96), the great cot-

FIG. 96.—Berlin is the center of the fine railroad system, which extends to the most remote parts of the empire. Freight is carried at cheap rates, and thus the railroads have had a large part in industrial development. The three classes of railroads are (1) the imperial railroads, such as those of Alsace-Lorraine, owned and managed by the imperial government; (2) the state railroads, controlled by Prussia, Saxony, Bavaria, and other states; and (3) private railroads, owned by incorporated companies like those of the United States and Great Britain. The state roads are most important, and those of Prussia include about one half of the mileage of the empire.

ton center of south Germany. The third cotton group is in Saxony (Fig. 94), with Chemnitz and Zwickau as the most active centers. German cottons are exported all over the world, with Central and South America as the largest purchasers.

The woolen mills are mainly centered at Chemnitz, Liegnitz, and Görlitz, near the fine wools of Saxony and

Silesia, and at Aix-la-Chapelle in the Rhine province, which receives a great deal of foreign wool. Chemnitz is famous for its hosiery, underwear, and shawls; while the output of woolens is not so valuable as that of cottons, the exports are larger. All the great trading nations, as well as the Rio de la Plata countries, are large purchasers. Bielefeld, in west Prussia, and Hirschberg, in Silesia, are the most important centers of the linen industry. The silk industry is mostly confined to the Krefeld district (Fig. 95). Much jute is imported from Bengal for manufacture into various fabrics.

Germany ranks next to Great Britain in shipbuilding. Its ocean vessels visit all points of the world, and carry most of the German trade (p. 48). The shipyards at Stettin, Hamburg, Danzig, and Kiel turn out many vessels, some of them among the largest and swiftest afloat, though twenty-five years ago the country depended chiefly upon British shipyards for its merchant marine.*

Railroads are numerous and freights are cheap (Fig. 96). Railroad and water transportation supplement, instead of rivaling, one another. Without this splendid development

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* Chemical industries have their highest development in Germany; large quantities of aniline dyes and other chemical preparations are exported, most of them to the United States. The making of leather and leather goods employs 600,000 persons; there are large imports of hides from America and India.

Germany strikingly illustrates the fact that the location of industries is determined to a great extent by the proximity of the raw products required. Thus distilleries are most numerous near the rye and potato fields of north Germany; beer brewing, an enormous industry, is most important in the hop and barley lands of Bavaria; lumber, wood carving, and wooden toy making, among the forests of the south; cheese making, in south Bavaria, Schleswig-Holstein and along the lower Rhine, rich in cattle; potteries, near the clay deposits at Meissen, where "Dresden ware" is produced; also in the Thuringian Wald, and other places; and glass works, in the mountain regions of Bavaria and at the foot of the Riesengebirge in Silesia.

of highways the present industrial success could not have been achieved. The main and branch railroads are most numerous in the iron and textile regions of Rhineland-Westphalia, Saxony, and Silesia. The great cities are the meeting points of lines coming from all directions.*

Germany exports manufactured articles and imports food and raw materials. Its foreign trade is over $3,000,000,000 a year, which is more than that of the United States. Its largest trade is with the United Kingdom; the United States holds the second place, followed by Austria-Hungary, Russia, and France. No machinery is bought unless it is better in quality or cheaper in price than can be produced at home; thus the imports of metal goods and machinery are comparatively small as compared with ex-

* Berlin, the capital, the largest city and the center of inland commerce, is engaged in all branches of industry, and is one of the leading money markets of the world; Elbing is the most eastern manufacturing city of large importance; Posen has distilling and brewing interests and machine shops; at Breslau the industrial products of the west are exchanged for the raw products of the east; Dresden, with manifold industries, is especially noted for artistic furniture, metal products, machinery, and paper; Leipzig, one of the largest commercial cities, is the center of the book and fur trades; Magdeburg, Brunswick, and Hanover, in the largest sugar-beet region, are the chief centers of sugar refining, and have large textile and other interests; Kassel is a large trading point, where the railroads from the North Sea ports meet those from Dresden and southwest Germany; Frankfort on the Main is one of the chief money centers of Europe; Nuremberg, at the convergence of several valleys, is a railroad center of south Germany and the chief manufacturing city of Bavaria; Munich, leading the country in beer production, is the largest grain market in the south; Augsburg has cotton mills, and is, after Munich, the chief commercial center of Bavaria; Stuttgart has large manufactures and is the main center of south German trade; Strassburg has iron, machinery, and leather manufactures; Mannheim, at the head of steamer navigation on the Rhine, imports grain and cotton from America, coal from the lower Rhine, and exports south German products; Cologne, the chief Rhine city, the central point of Rhine navigation, is famous for the manufacture of eau de cologne.

ports. The total exports are about three-fourths as large as the imports. The commodities it buys from the United States are worth over twice as much as those it sells to this country. It takes from our cotton states every year over $40,000,000 worth of cotton, and also purchases enormous quantities of maize, wheat, oats, meats, copper, petroleum, lumber, and oil cake. The trade policy is that of protection. The Zollverein (Customs League) applying to Germany and Luxemburg, covers the whole empire except the free ports.

Germany has become a great commercial country since the war with France in 1870–'71. One effect of that struggle was to consolidate the rival German states into an empire, resulting in a fusion not only of political but also of economic interests. The new nation has advanced with wonderful rapidity in industrial development and in sea-carrying capacity, rivaling all other traders, in every market, by the excellence and cheapness of its manufactures.

STATISTICS FOR GERMANY

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS)

	1872–'75.	1881–'85.	1891–'95.	1908.
Imports	935.0	785.0	1,064.5	1,824.0
Exports	623.5	790.0	860.5	1,522.8

TRADE WITH PRINCIPAL COUNTRIES, 1908 (IN MILLION DOLLARS)

	Imports.	Exports.		Imports.	Exports.
United States	305.2	120.8	Belgium	65.5	80.7
Great Britain	174.2	249.3	Netherlands	57.6	113.4
Austria-Hungary	187.8	184.2	Italy	58.9	77.8
Russia	225.7	108.6	Argentina	111.4	36.7
France	104.9	109.5	Switzerland	44.2	100.2

IMPORTS FROM THE UNITED STATES (IN MILLION DOLLARS)

1880.	1891.	1895.	1900.	1904.	1905.
57	108	121	266	215	239

Gold standard, with the mark (value 23⅘ cents) as the unit of coinage. Metric weights and measures.

Population in 1905, 60,641,278.

CHAPTER XXI

FRANCE

France fronts both the Atlantic and the Mediterranean (Fig. 1). The large ports of England are only a few hours' sail from the northern shores of the country; the North Sea gives speedy access to all north Europe; the Atlantic routes to South American and African ports are shorter than those of England, Germany, and the Netherlands; and the Mediterranean gives superior facilities for trade with north Africa, the Levant, and all Eastern countries. Only Spain, among European lands, shares with France the advantage of being bordered by two great commercial seas.

Half the country is lowland and half is highland. A line, 530 miles long, drawn from Bayonne in the southwest to the Ardennes in the northeast (Fig. 97) roughly divides the rolling plains west of it, which are less than 600 feet above sea level, from the highlands to the east. Most of the mineral and metal industries are in the highlands; most of the general manufactures are scattered over the plain. The climate is temperate, the warm, moist winds from the west bringing abundant rain.

There are few good harbors. A large part of the coast line is unbroken by important inlets; most of the harbors, therefore, are river ports like Havre, Rouen, Nantes, and Bordeaux, or artificial harbors like Cherbourg, which, by costly breakwaters, has been made one of the finest artificial harbors in the world. The most important harbors are Marseilles, Havre, Bordeaux, and Dunkirk.

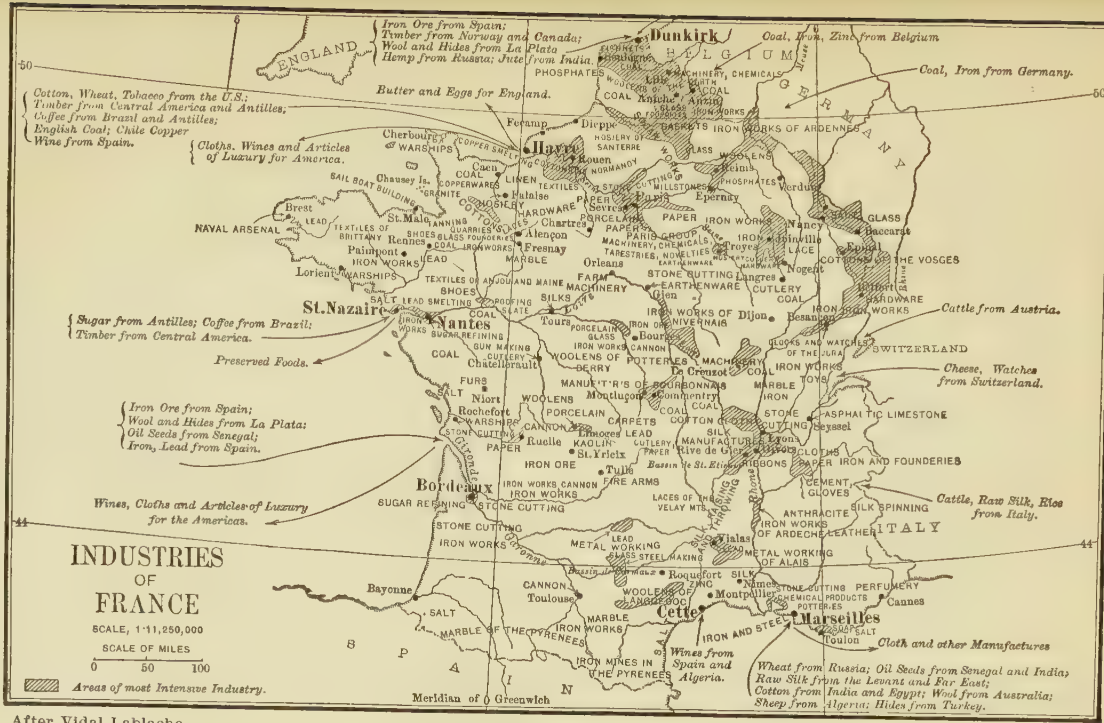
INDUSTRIES OF FRANCE
SCALE, 1:11,250,000
SCALE OF MILES
0 50 100
Areas of most Intensive Industry.
Iron Ore from Spain; Timber from Norway and Canada; Wool and Hides from La Plata; Hemp from Russia; Jute from India.
Butter and Eggs for England.
Coal, Iron, Zinc from Belgium
Coal, Iron from Germany.
Cotton, Wheat, Tobacco from the U.S.; Timber from Central America and Antilles; Coffee from Brazil and Antilles; English Coal; Chile Copper; Wine from Spain.
Cloths, Wines and Articles of Luxury for America.
Sugar from Antilles; Coffee from Brazil; Timber from Central America.
Preserved Foods.
Iron Ore from Spain; Wool and Hides from La Plata; Oil Seeds from Senegal; Iron, Lead from Spain.
Wines, Cloths and Articles of Luxury for the Americas.
Cattle from Austria.
Cheese, Watches from Switzerland.
Cattle, Raw Silk, Rice from Italy.
Cloth and other Manufactures
Wheat from Russia; Oil Seeds from Senegal and India; Raw Silk from the Levant and Far East; Cotton from India and Egypt; Wool from Australia; Sheep from Algeria; Hides from Turkey.
Wines from Spain and Algeria.
ENGLAND
BELGIUM
GERMANY
SWITZERLAND
ITALY
SPAIN
Meridian of 0 Greenwich
50
44
6
Dunkirk
Lille
Anzin
Dieppe
Fecamp
Havre
Rouen
Caen
Cherbourg
Chausey Is.
St. Malo
Brest
Rennes
Paimpont
Lorient
St. Nazaire
Nantes
Paris
Sevres
Chartres
Alençon
Fresnay
Falaise
Reims
Epernay
Verdun
Nancy
Baccarat
Epinal
Belfort
Troyes
Nogent
Langres
Dijon
Besançon
Orleans
Gien
Tours
Bourges
Chatellerault
Niort
Rochefort
Ruelle
Limoges
St. Yrieix
Tulle
Montluçon
Commentry
Le Creuzot
Lyons
Rive de Gier
Seyssel
Bordeaux
Bayonne
Toulouse
Roquefort
Vialas
Nimes
Montpellier
Cette
Marseilles
Toulon
Cannes
Gironde
Garonne
Loire
Seine
Rhone
Meuse
Rhine
Bassin de St. Etienne
NAVAL ARSENAL
WARSHIPS
COPPER SMELTING
COAL
LINEN
TEXTILES
COTTONS
HOSIERY
HARDWARE
PORCELAIN
PAPER
COPPERWARES
GRANITE
SAIL BOAT BUILDING
TEXTILES OF BRITTANY
LEAD
IRON WORKS
TANNING
QUARRIES
SHOES
GLASS FOUNDERIES
TEXTILES OF ANJOU AND MAINE
SHOES
SALT
LEAD SMELTING
ROOFING SLATE
SUGAR REFINING
GUN MAKING
CUTLERY
FURS
PHOSPHATES
MACHINERY, CHEMICALS
COAL
IRON WORKS OF ARDENNES
GLASS
WOOLENS
HOSIERY OF SANTERRE
NORMANDY
MILLSTONES
STONE CUTTING
PARIS GROUP
MACHINERY, CHEMICALS, TAPESTRIES, NOVELTIES
EARTHENWARE
IRON WORKS
LACE
COTTONS OF THE VOSGES
HARDWARE
IRON WORKS
CUTLERY
STONE CUTTING
EARTHENWARE
FARM MACHINERY
SILKS
IRON WORKS OF NIVERNAIS
PORCELAIN
GLASS
CANNON
WOOLENS OF BERRY
POTTERIES
MANUF'T'R'S OF BOURBONNAIS
MACHINERY
CLOCKS AND WATCHES OF THE JURA
TOYS
MARBLE
IRON
STONE CUTTING
ASPHALTIC LIMESTONE
COTTON
SILK MANUFACTURE
CLOTHS
PAPER
IRON AND FOUNDERIES
RIBBONS
CARPETS
KAOLIN
IRON ORE
IRON WORKS CANNON
FIRE ARMS
LACES OF THE VELAY MTS.
SILK THROWING
CEMENT, GLOVES
SILK SPINNING
ANTHRACITE
IRON WORKS OF ARDECHE
LEATHER
METAL WORKING OF ALAIS
METAL WORKING
GLASS STEEL MAKING
WOOLENS OF LANGUEDOC
ZINC
SILK
STONE CUTTING
CHEMICAL PRODUCTS
POTTERIES
PERFUMERY
SOAP
SALT
IRON AND STEEL
MARBLE
IRON WORKS
IRON MINES IN THE PYRENEES
MARBLE OF THE PYRENEES
CANNON
STONE CUTTING
IRON WORKS
After Vidal-Lablache

FIG. 97.

Marseilles is the leading port (Fig. 97). With a movement of 8,000,000 tons a year, it controls the French trade with Mediterranean countries and the Orient, is the inlet for the grain of the Black Sea and Algeria, and, as the port of Lyons, receives raw silk from the far East. No other port rivals Marseilles in the quantities of olive, palm, ground nut, cotton seed, and other vegetable oils or oil-seeds brought in; it is also one of the largest coffee markets of the world. The commerce of Marseilles naturally shapes the city's leading industries, such as soap and oil factories, flour mills, and sugar refineries.

Havre, at the mouth of the Seine, is the second port. It is strictly a forwarding port, in other words, nearly all it receives is sent inland or to sea, very little being retained, as the city produces little except machinery and ships. Raw products have the first place in its imports (Fig. 97); as the port of Paris and of the great manufacturing districts of the north, its exports include many articles of novelty and luxury, as well as wares for ordinary use. Its movement is 4,000,000 tons; its most important traffic, outside of European ports, being with America.*

France is less favored with navigable waters than Germany. The Seine is the most important river (Fig. 98). It is navigable by river boats beyond Paris. The Loire and Gironde are subject to great variation in level; the lower

* Bordeaux, on the Gironde, has the disadvantage of a shallow approach. It is the chief wine port, being near the red-wine district of Bordeaux, which supplies more exports than any other region. Dunkirk (movement 1,800,000 tons) is favorably situated for bringing in raw materials for the great manufacturing towns of the north; its imports are eight times as large as its exports. Rouen formerly depended upon Havre as its port, but the deepening of the Seine has made the city important for grain, cotton, and other imports. Nantes and St. Nazaire are ports of less importance. Cette imports wine to mix with French vintages. Cherbourg and Brest are naval stations. Calais, Boulogne, and Dieppe trade with North Sea ports, but are mainly important in the passenger trade with England.

Rhone is scarcely navigable, though the Saone and Doubs, its upper tributaries, carry much commerce. Nevertheless the coal, lumber, agricultural products, and other heavy

FIG. 98.—Observe the canals connecting eastern and western river systems, thus providing water highways across France to Belgium and Germany; the waterways from St. Malo and Brest to the Loire and from the Gironde to the Mediterranean. A sea-level canal is being built from Marseilles to the Rhone.

freight carried on the rivers and canals amount to many million tons a year. Half the coal used in Paris is brought by water; the water carriage to and from that city exceeds the tonnage of Marseilles. A quarter of France's internal trade is carried on the waterways.

Agriculture is the greatest industry (Fig. 99). Half of the 39,000,000 inhabitants earn their living on farms. There are nearly as many farms as in the United States (over

5,000,000), and, as France is smaller than Texas, the farms are small, averaging only fifteen to seventeen acres each.*

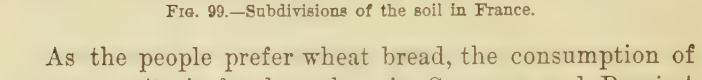

FIG. 99.—Subdivisions of the soil in France.

As the people prefer wheat bread, the consumption of rye *per capita* is far less than in Germany and Russia.† Bread and cheap wine are the food and drink of the masses, meat being too expensive for daily use. The result is that grain fields cover one fourth of France, and wheat is worth more than all the other cereals together (Fig. 100). Though France is one of the largest wheat-growing countries (Fig. 36), the demand exceeds the supply; about 33,000,000 bushels are purchased every year from America and Russia. Little flour is imported, as mills grind wheat in many cities.‡

Oats is the second most important cereal. Rye and barley are raised on the poorer soils of the coast and among the highlands; maize, requiring more heat than wheat, grows only in the south. All cereals are imported in large quantities; little is exported except wheat flour and alimentary pastes.

The sugar beet is the most important industrial plant (Fig. 100). It is grown exclusively on the rich plains of

* The land is also divided among small owners in other countries of Europe, except in Great Britain, Hungary, Spain, Italy, and Russia, where large estates predominate.

† In 1860 rye bread was the staple food of the peasantry, who soon after began to discard rye for wheat. The wheat-eaters of the world were estimated at 371,000,000 in 1871 and 516,000,000 in 1898. Every great railroad opened adds to the number of wheat-eaters.

‡ The manufacture from wheat flour of alimentary pastes, such as macaroni, vermicelli, etc., which originated in Italy, is now a constantly growing industry also in France, Germany, Switzerland, and some other countries. The French output is about 170,000,000 pounds per year.

the extreme north, where about 500 factories, working night and day, make the raw sugar that is sent to the refineries of Paris, Lille, Marseilles, Bordeaux, Nantes, and Havre (Fig. 44). Many small distilleries on farms also use the beet in the production of alcohol. A great deal of sugar is exported, particularly to the United Kingdom.

Tobacco (Fig. 100) is raised in but twenty-five departments, as the Government forbids its cultivation in all dis-

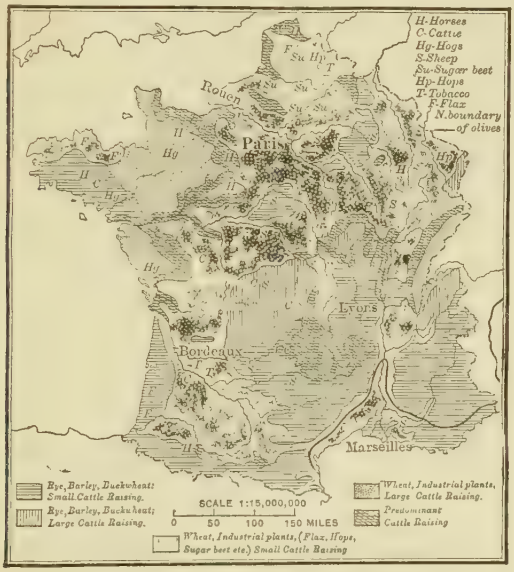

FIG. 100.—Agriculture and animal raising.

tricts which fall below a certain quantity. The Government has a monopoly of the production, manufacture, and sale of tobacco, over $90,000,000 being annually added to the state revenues from this source.*

*The result is that tobacco is nowhere so expensive as in France; all countries of north Europe largely exceed France in *per capita* consumption. Matches and gunpowder are also a Government monopoly yielding a profit to the state of over $10,000,000 a year.

Hops, grown chiefly in the north and east, supply the brewing industry, which is most active there. Flax and hemp cover a large area, but the imports from Belgium and Russia are large. Among vegetables, the potato is most valuable, the crop being about half as large as that of Germany.

France is the greatest wine-growing country (Fig. 101). Wine is the national beverage (p. 69); over 1,198,000,000

FIG. 101.—WINE AND FISHERIES.

The shaded areas are the wine-growing regions. The leading fishery ports are shown by dots of various sizes, according to relative importance.

gallons were produced in 1909. The climate and soil gave France supremacy in this industry till the phylloxera (1882–'92) ravaged the vines and reduced the crop below that of Italy. By grafting upon stock imported from America, France has overcome this terrible pest and resumed the first place in production. Wine is imported

from south European countries and Algeria to mix with the cheap wines of France. The exports are mainly champagne and the red and white wines of other districts, the two greatest centers of export wines being Champagne and Bordeaux. Exports average $38,000,000 a year; imports, a third less. Exports are sent to all north European countries, America, and the Orient. England, which produces no wine, is by far the largest foreign consumer of champagne. Enormous quantities of cider in the northwest and beer in the northeast are also manufactured; Charente is the great brandy-producing district.

Cattle breeding is the most important animal industry (Fig. 100). Cattle graze in grassy meadows all over the great plain, the industry being particularly active near large markets for beef and dairy products. The northwest produces the best butter, sending large quantities to London and Paris. Normandy is at the head of cheese making; Camembert and Neufchatel, among Normandy's cheeses, are well known in foreign markets, also Brie, a product of the northeast. The famous Roquefort, made in south France of ewes' milk, is cured in deep rock cellars by methods handed down through many generations.

Breton, Percheron, and Flemish horses are well-known draft varieties. Nearly all the horses are raised north of the Gironde, while mule-raising is a large industry between the Loire and the Pyrenees.

Sheep (Fig. 100) producing superior wool and other breeds highly esteemed for mutton have decreased, owing largely to the widening of plowed lands at the expense of pasturage; as a result, great quantities of wool are imported from the Rio de la Plata countries and Australia to mix with home wools. The best domestic fiber is reserved for the finest products of French looms.

Compared with other leading nations of Europe, France has small external trade in animals and their products, except in the import of raw wool and silk and

the export of their manufactures and of poultry and eggs. Enormous quantities of eggs are sent abroad, mainly to England.

France has high rank among fishing countries (p. 92). This is due mainly to the extent of the cod fisheries and the assiduous cultivation of the oyster. Fig. 101 shows the nature of the sea fisheries and the leading fishing ports. The Atlantic fisheries are chiefly north of the mouth of the Gironde; numerous oyster beds are planted in the Bay of Biscay and east of St. Malo in the English Channel. French oysters, inferior to the American product, are eaten in France only on the half shell. Canned sardines are sent all over the world: fish, too, are eaten extensively in the country, which, being Roman Catholic, abstains from flesh many days in the year, requiring a large and constant supply of fish. French rivers, which had become almost destitute of fish, have been stocked with much American fry.

France is deficient in building timbers. Wood is the principal fuel for domestic purposes, but there is not enough of the kinds of timber required for buildings and furniture; ever-increasing quantities of lumber from north Europe and of cabinet woods from the tropics are imported.

France is one of the large producers of coal (Fig. 58). Her production, however, both of coal and iron is small compared with that of the United States, Great Britain, and Germany. A third of the coal used is imported from England, Belgium, and Germany. Three fifths of the home supply is taken from the French-Belgian field in the extreme north (Fig. 97). The sheep districts of the northeast and the wool imported at Dunkirk make this region—from Roubaix, near Lille, to Reims—the great center of the woolen industry. Here also are large iron and machinery industries, but the iron must be brought to the coal from Belgium, Luxemburg, Germany, and Spain. The second

largest sources of coal are the areas around Le Creuzot and St. Étienne, the only regions in France where coal and iron are found together. Many smaller coal mines in the west and center nourish the industries around them.

The richest deposits of iron are near the German frontier, south of the Ardennes. Particularly around Chavigny and neighboring Nancy nine tenths of the iron ore produced in France is mined. Most of the iron and steel is made in the regions around Lille, Nancy, and Le Creuzot (Figs. 61 and 65). St. Étienne is noted for its superior steel. The cost of transport being high, manufacturers who are compelled to bring coal from a distance are at a disadvantage.

The richest salt mines (rock salt) are near Nancy; two thirds of the salt is obtained, however, from salt marshes along the flat coasts from the Loire to the Gironde and from Cette to Marseilles.

France excels in the quality of her manufactures. In quantity she is far surpassed by the United States, Great Britain, and Germany. While factories and shops are scattered all over the country, the principal industrial centers are situated in the north, in the southeast and in the Paris district (Fig. 97).

The most numerous iron and steel works are on the rich coal field of the north (Fig. 97). Fives and other suburbs of Lille produce locomotives and much machinery. Most of the cast and wrought iron and steel are produced at Fives-Lille, around Nancy, and at Le Creuzot, the latter being the seat of the largest metallurgic industries of France, rivaling Essen in Germany and Seraing in Belgium. A large part of the rails and locomotives used on French railroads and many cannon come from its rolling mills, shops, and foundries. Marseilles' great importance in iron and steel working is due to the ease with which she gets coal by water from St. Étienne and iron ore from Algeria and Sardinia. The cast iron and steel of Bordeaux and other towns in the southwest are made mainly from Spanish ore.

Few metal goods are imported; the exports are not one third as great as those of woolens or silks.*

Textiles employing over 700,000 persons have the first place. They are mainly found near the coal fields or sources of raw material, and the most distinctive of them is the silk industry. Silkworm culture, carried on since the fourteenth century in southern France where the mulberry thrives, is now chiefly confined to the Rhone valley; it has greatly declined, owing to the silkworm disease and the competition of raw silk from China, Japan, Italy, and Turkey, so that French silk mills now import nine tenths of the raw silk they consume. Lyons is the greatest silk market and the largest producer of silk broad goods in Europe (Fig. 97), but many other cities are noted for silk products—as St. Étienne for ribbons, Avignon, near the Rhone delta, for light fabrics, Tours, for hosiery, and Paris, for gauzes and tulles. France once controlled the world's silk markets, but in recent years the large development of the industry in the United States, Germany, and Great Britain has offered such serious competition that French exports have declined.

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* Leather working is a great industry, especially where the most cattle are raised. All the large cities have immense shoe factories, turning out $100,000,000 worth of shoes every year, many of the finest kinds. About a sixth of the output is exported to the Orient and South America. Goat skins sent from north Africa and the Levant are turned into morocco leather; kid and other gloves, among the best made, are sent everywhere; perfumery, made chiefly in Paris and its environs, is widely demanded; the manufacture of glassware is a notable industry, and the cut glass of Baccarat is known in all markets. France is distinguished for the good taste, elegance, and finish of her goldsmithery, bronzes, and other artistic work, but other nations are trying, not without considerable success, to compete with her in this field. Paris is a center of goldsmithery and diamond cutting; the art pottery made at Sèvres, near Paris, excels in design and decoration; a large part of the finest porcelain of France is sold abroad, Limoges, for example, sending to the United States two thirds of its best china ware.

The largest cotton-manufacturing city is Rouen, in the Normandy cotton group; the next most important region is in the north, with Lille and the neighboring cities of Roubaix and Tourcoing as the principal centers. The eastern group, a little northwest of Lyons, is third in importance. Less than one per cent of the output is exported, most of the exports going to the French colonies. Two thirds of the raw cotton comes from the United States through Havre, and the balance from Egypt, India, Turkey, and Brazil, mainly through Marseilles.

The finest of wool fibers have long been produced by crossing French sheep with the Spanish merino. France, however, produces scarcely a fourth of the wool she manufactures. The great center of the industry is in the north, where Roubaix, Tourcoing, and other towns near Lille make one third of the woolen cloths (Fig. 97). Paris, Reims, and Lyons make shawls. France spins most of her woolen yarns, while Germany imports large quantities for her mills. Woolens are usually the largest of all exports, French woolen cloths everywhere holding their own against competition.

Linen is made chiefly at Lille, Roubaix, and in many other towns of the north where it is most convenient to import flax from Belgium and Russia. The exports are small. Nearly 300,000 persons are employed in various cities making laces which are famous in all markets. Point d'Alençon is the only French lace worked exclusively with the needle.

Railroads doing the most business converge at Paris. This city, which is both the capital and the heart of France, leads the country in commerce and politics, and influences the whole world in matters of taste, luxury, and fashion. Railroads having the largest traffic are those from the chief seaports to the capital, bringing Paris into touch with steamship lines plying from Marseilles to Mediterranean ports, Australia, and the Orient; from Bor-

deaux to West Africa and South America; from St. Nazaire to Vera Cruz and Colon; from Havre to New York and New Orleans; and from all ports to other European countries.*

The merchant marine is the smallest among the four leading nations (p. 48), carrying only a third of the deep-sea trade. Vessels unloading large cargoes at French ports sometimes find it difficult to get full return loads.

The principal imports are food and raw materials; the largest exports are manufactured articles. France imports a great deal more than she exports. Most of her foreign purchases are bulky and heavy commodities, such as coal from England, lumber from Scandinavia, and cereals from the United States. Most of her foreign sales weigh little and are so high in price that they do not compete with plainer goods of the same varieties; among these goods are fine and costly textiles and innumerable novelties and artistic products known in the trade as *articles de Paris*. The agricultural specialties—wine, sugar, and cheese—greatly swell the exports. Great Britain has the first place in the foreign trade, but the imports from the United States, mainly cotton, cereals, petroleum, and meats, almost equal in value the coal, metals, foodstuffs, and manufactures which France buys from Great Britain. France sells little more to the United States than she does to Algeria, because, first, we now make at home many things formerly purchased in French markets; and second, the high tariff which this country imposes on silk and woolen goods and

* An enormous amount of foreign merchandise, worth over $150,000,000 a year, is carried across France on its way to other countries. Most of this freight originates, according to value, in Switzerland, Germany, Belgium, Italy, Mexico, England, and Spain, in the order named. Most of it is destined, according to value, for England, the United States, Switzerland, Spain, Argentina, and Italy. It is very profitable for any nation to be a large freight carrier for other countries.

all articles of luxury reduces the purchases of high-priced French products.

France is not a great competitor in the world trade. She excels in industries requiring manual skill and good taste, but her most characteristic products do not meet the world-wide demand for cheap commodities, which are the outcome of the most highly improved machinery and great economy of labor. This is the main reason why her share in the international export trade is much smaller than that of the other leading countries.

STATISTICS FOR FRANCE

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS)

	1878–'86.	1887–'96.	1901.	1908.
Imports	892.0	820.0	843.2	1,088.6
Exports	669.5	681.5	774.5	974.7

TRADE WITH OTHER COUNTRIES (IN MILLION DOLLARS) *

Mean of 1907–'08

COUNTRY.	Imports into France.	Exports from France.
United Kingdom	173.4	253.0
Belgium	86.0	165.4
Germany	126.4	131.0
United States	141.0	71.7
Algeria	56.1	76.0
Spain	32.6	26.4
French colonies	115.0	101.5
Italy	37.1	53.8
Switzerland	19.1	58.1
Argentine Republic	56.4	28.6
Russia	52.2	13.2

Population (1908), 39,300,000.

Gold standard, the unit of coinage being the franc (valued at $19\frac{3}{10}$ cents). Metric weights and measures.

* In 1904 imports from the United States were 70.5; exports, 87.9.

CHAPTER XXII

BELGIUM

Two races live in Belgium. For centuries this fact was unfavorable to peace and business. Though their country is one of the smallest in Europe, north of the parallel of Brussels in east and west Flanders live the Flemings, nearly allied to the Dutch, south of Brussels live the Walloons, a mixture of ancient Roman, Teutonic, and Celtic elements. Flemish is spoken in the north and French in the south, French being the prevailing language in official life and in literature. The country, about as large as Maryland, is the most densely peopled state in Europe.

There are no good harbors on the forty-two miles of sea-coast. The North Sea is but thirty feet deep five miles from land, and the harbors are interior ports. The country is low and flat, except in the southeast, where the Ardennes hills are over 2,000 feet high. The sandy soil has been made fertile by the most careful tillage, so that the yield of wheat and other cereals is more per acre than in any other land except Great Britain. There are only two important navigable rivers, the Schelde and the Meuse (Maas in Holland), both of which have the disadvantage, so far as Belgium is concerned, of reaching the sea in the Netherlands. The climate is temperate, with the largest rainfall in the west near the sea.

The principal farm products are cereals, flax, hemp, and colza (Figs. 102, 103). Belgium does not produce sufficient breadstuffs to feed her people, and wheat is largely

imported from the United States and other wheat countries. The sugar beet grows in quantities to allow a large

Fig. 102.

export of sugar. Flax of a superior quality is grown in the Valley of the Lys, whose waters, free from lime salts, are

particularly valuable for retting. Hemp and colza are largely grown in Flanders. Colza is rape, which is raised for its oily seed. Oats is a large crop in the Ardennes hills, and barley, hay, and pasturage thrive in the low

FIG. 103.—SUBDIVISIONS OF THE SOIL IN BELGIUM.
Wheat fields occupy a quarter of the arable lands.

coastal belt. The potato is almost as much used for food as wheat, and in no part of Europe is larger space given near the great cities to market gardening and to the raising of flowers.

Herds are pastured in most parts of the country, the best grazing regions for cattle being in the Campine, a sandy region now restored to fertility by irrigation. Here the finest butter in Belgium is made. Sheep thrive best in the drier eastern and southeastern part of the country, where, though there are only about 400,000 of them, wool manufactures are most developed.

Poultry is raised throughout Belgium, and large quantities of eggs and young fowls are exported to England and to the cities of northern France. Flanders and Brabant (the province of which Brussels is the capital) are famous for horses. They make a specialty of breeding fine draft horses, mostly Flemish and Norman, which sell at high prices. Liège is the principal horse market, and the Monday sales are often attended by buyers from most of the countries of Europe. Still the imports of horses are larger than the exports, chiefly on account of the importation from England of horses for slaughter, Belgium being one of the countries in which considerable horse meat is eaten. Some thousands of draft horses are usually sent to Belgium every year from the United States.

Agriculture is of subordinate importance as compared with mining and manufacturing (Fig. 104). Belgium's mineral

resources have made her a large industrial country. Over 23,000,000 tons of coal a year are mined in the rich fields that stretch across the country from France to Germany. About three-fourths of the coal is consumed at home, and the rest is exported mainly to France, where it sells at about one-fourth higher prices than in Belgium. Fortunately, iron ore is found in the coal fields of the Meuse River, especially around Namur and Liège; but the production—about 350,000 tons a year—is insufficient for the industries of the country. Several times as much iron ore as Belgium produces is annually imported, most of it from Luxemburg.

Near Moresnet, on the eastern edge of Belgium, are some of the richest zinc mines in Europe, yielding annually about 90,000 tons, a great deal of which is exported. Considerable quantities of copper and lead are produced near Verviers and Liège. Limestone, sandstone, and slate quarries, in the central and southeastern part of the country, yield abundant supplies of building stone, lime, marble, and roofing slate. Belgium produces about 1,300,000 tons of pig iron a year and 1,400,000 tons of steel, holding the fourth place in Europe as a producer, after Great Britain, Germany, and France.

Belgium is pre-eminently a manufacturing country (Fig. 104). It is not only one of the most important, but also one of the oldest industrial states. It has the advantage as an industrial nation of great mineral resources, dense population, skilled labor, and large capital. More than 1,000,000 people, employing the best machinery, are engaged in manufacturing pursuits, and a very large part of their product is intended for export. Belgium produces more manufactured goods *per capita* than any other nation of continental Europe.

The metal industries, which are based on the production of coal, iron, steel, lead, and zinc, are of the first importance. The principal centers of these industries are

Charleroi, Namur, and Verviers. Liège, in the center of the mining district of east Belgium, is one of the great manufacturing cities of the country. It has long been famous for its firearms, turning out cannon and about 1,000,000 small arms a year, which are sold all over the world. Machinery, glass, and chemicals are also large products of Liège and the neighboring city of Seraing.

About one fifth of the entire population of the country is employed in mining and the working of metals and fibers. The skill and aptitude the workmen have acquired, together with abundance of coal at the doors of the factories, have enabled the Belgians to compete with Great Britain and Germany in marketing industrial products that are both excellent and cheap.

Belgium makes most of her own machinery, selling other countries three times as much as is bought from them. Machinery and tools for the working of metals are large products of Charleroi, Mons, and Liège. Ghent makes spinning and weaving machinery; Dinant is noted for tin and copper wares. All kinds of railroad materials are made in large establishments at Brussels, Liège, Seraing, and Verviers. Liège, Namur, and Charleroi are pre-eminent for nails and other hardware. The porcelain and glass works are along the coal belt from Jemmapes, with its large crockery industries, to Liège.

Belgium, in proportion to population, makes twice as much woolen cloth as France produces. The people of Flanders, in the middle ages, were the greatest woolen-cloth makers in Europe; but the woolen industries have been transferred to Verviers, Dolhain, Limburg, and the surrounding country, where it is most convenient to collect the home supplies of wool.

Linen and cotton have largely superseded woolen fabrics in northwestern Belgium. Large supplies of cotton are shipped up the Schelde River to Ghent, which is the chief city of cotton production, though Courtrai and Tournai

are also important centers. Belgium makes the finest of cottons, and also, like England and Germany, turns out large quantities of cheap goods for the Congo and other African markets. Ghent holds the first rank in the spinning and weaving of flax, and Belgian artisans excel also in the production of fine linens. Brussels, Courtrai, and Bruges are also large linen producers. Mechlin has contributed more than any other city to make Belgium famous for its laces, over 150,000 girls and women making lace here and in other towns.

Beer is the national beverage; breweries are therefore numerous, the product of Louvain being particularly esteemed. Antwerp is the great center of distilleries which employ cereals, beets, and the potato in the manufacture of alcoholic liquors. Belgium makes all its sugar, and exports large quantities. Sugar mills are scattered over the country from Hainault to Antwerp, a large part of the product being refined in Antwerp, as it is most conveniently shipped from that city.

Seven eighths of the sea trade passes through the port of Antwerp. At flood tide the largest vessels may ascend the Schelde to its wharves. Brussels, Ghent, and Bruges are interior ports, which are being transformed into maritime ports by the deepening of the canal and river from Brussels, the Terneuzen canal from Ghent, and the canal from Bruges to Zeebrugge on the North Sea near Ostend. Belgium has practically no merchant marine, British, Dutch, and American steamers making millions of dollars in the Antwerp trade. Shipping movement, 1908, 22,100,000 tons.

A network of canals and railroads covers the flat country, which, with its sea connections, affords Belgium marked advantages for trade with the surrounding countries. A large system of interior navigation has been developed, the canals serving not only for freight boats, but also to drain the lowlands and to irrigate the Campine. The Meuse has been canalized as far as the German frontier, and the

Schelde is navigable above Ghent by means of locks. Situated between great commercial nations, Belgium does a great forwarding business. In 1908 commodities worth $405,000,000 entered the country on their way to Germany, Switzerland, and other continental countries, or passed through Belgium on the way to Great Britain, the United States, and other western lands.

Belgium buys foodstuffs and raw materials and sells manufactured products. The forest area is inadequate for the production of the lumber required, and consequently the imports are large. Building lumber is one of the most important articles in the Belgian import trade. Sweden and Norway supply the greater part of it, followed closely by Russia, Germany, France, and the United States.

The largest imports are cereals, fibers, timber, and chemicals. A large part of the grain, cotton, and animal products consumed come from America. The leading imports from the United States are wheat, maize, cotton, meats, refined petroleum, drugs, unmanufactured tobacco, and oil cake. Belgium's largest export and import trade is with the neighboring countries—France, Great Britain, and Holland, except that the imports from the United States are usually larger than from any other country except France. The manufacture of fine furniture for export, particularly church furniture, is an important industry of Ghent.

The chief exports are yarn, coal, cloths, machinery, iron and steel, raw and refined sugar, glass, zinc, and mineral substances. The United States buys from Belgium less than half as much as she sells to her, the most important purchases being firearms, cement, raw wool, india rubber (from the Congo), glass, and raw beet sugar. Belgium supplies the world with most of its ivory, as the Congo Free State, of which the king of the Belgians is sovereign, is the largest source of supply; Antwerp is the leading ivory market.

Manufactures and mining have made Belgium one of the richest countries in Europe. It can consume only a

part of its manufactures; as the prosperity of the country depends upon large foreign markets for its surplus, its merchants have in recent years pushed its trade in foreign lands with much energy.

The Grand Duchy of Luxemburg is a neutral area between Belgium and Germany. It has very rich deposits of iron and exports much ore to Germany, Belgium, and France. Most of the inhabitants are farmers, vineyards being particularly numerous. The chief industries are iron working and glove manufactures. As a member of the Zollverein, Luxemburg's trade statistics are included with those of Germany.

STATISTICS FOR BELGIUM

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS)

	1881–'85.	1891–'95.	1901.	1902.	1908.
Imports	302.0	326.5	428.7	439.3	642.2
Exports	260.0	277.0	352.8	358.5	483.7

TRADE OF THE UNITED STATES WITH BELGIUM (IN MILLION DOLLARS)

	1880.	1900.	1902.	1908.
Imports from	12.0	9.3	10.3	65.9
Exports to	34.1	26.6	48.8	14.1

Population (1908), 7,386,000.

Gold standard, with the franc as the unit of coinage. Metric weights and measures.

NOTES AND QUESTIONS

The Belgians have shown great genius for the development of large industrial enterprises. They substituted machine for hand work, and have benefited as much proportionally as Great Britain did by taking this step. They established large depôts at Antwerp for the collection and distribution of abundant raw material. Their country is too small to give full opportunity to their enterprise, so large Belgian capital is invested in industries, street-car lines, electrical works, and many other enterprises in Russia, Persia, East Asia, north and tropical Africa, and South America.

What is the effect upon transportation of the fact that Belgium is mostly flat?

The abundance of what fuel and mineral supplies at home or near at hand have stimulated manufacturing?

Have not the Belgian farmers admirably corrected and completed the work of Nature?

The rich grazing lands of the polders were worthless till sea walls were built and drains dug. Large areas of marsh now yield great crops, and the excess of sandy soil has been corrected by fertilizers and irrigation.

CHAPTER XXIII

THE NETHERLANDS

The Dutch are a trading and cattle-raising nation. They are the best example of a people who have become wealthy by trade, though their manufacturing industries are very small. Large colonial possessions have widened their field of activity, which is restricted at home, and supplied them with much material for the exercise of their mercantile talents.

The Netherlands is the lowest and flattest country in Europe. (The name means "low country"; it is also called Holland, Woodland, the name of the principal province.) About three sevenths of the surface, the land nearest the sea, is at or below the level of the sea. The reclamation of this land is one of the great achievements of human energy. Dikes fifty to sixty feet high have been reared along the coast to keep out the sea, the banks of the rivers have been raised to keep the waters in the channels, marshes have been drained, and drifting sands successfully fought. The latest enterprise is to build a dike across the entrance to the Zuider Zee (South Sea) to transform it into a fertile plain; years may elapse before the work is completed.

The flat surface and numerous waterways facilitate commerce. Transport of goods is exceedingly easy, because (1) the country is covered with a network of canals, which serve the triple purpose of affording navigable highways, draining the land, and taking the place of fences around many fields; (2) the rivers are international and provide

cheap carriage, on the Maas (Meuse in Belgium and France) across Belgium, and on the Rhine to southern Germany; and (3) the level lands make railroad building easy, though many bridges are required. Smooth brick wagon roads cover the country, where, a century ago, there was not a rod of good highway.

The winds, unimpeded by highlands, are a source of power. In no country is wind energy so largely utilized as in the Netherlands, many of the reclaimed areas being kept dry by pumps operated by windmills, which are also used to supply power for various industries. The east winds tend to make the winters severe, but, on the whole, the climate is agreeable.

Agriculture thrives best in the reclaimed lands and on alluvial soils formed by the rivers. The best soils, therefore, are near the sea or in the south. Much of the country is too sandy for the best tillage, but cereals are raised in the east (Fig. 102), where great rivers enter the country; the reclaimed lands and polders on and near the coast have abundant rainfall, with a rich growth of grass, making them a zone of pastures, where great numbers of cattle and horses are raised, and dairying is a large industry. The polders—low, inland tracts, protected by dikes from the waters that formerly made them unhealthful marshes—extend through the Netherlands and Belgium, and are among the best lands in both countries (Fig. 105).

Beet sugar, rye, and vegetables are the chief agricultural products. The country ranks sixth in the production of beet sugar, raised in the richer lands of the river valleys (Fig. 44). Only a small part of the people eat "black" rye bread, preferring a mixture of rye and wheat; much American wheat supplements the home supply. The raising of vegetables and flowers for the home and British markets are large industries, Haarlem being the center of the trade in flowers. But the most important resource of the Dutch farmer is cattle, which were formerly sent alive

in great numbers to England (p. 78). In proportion to area, the Netherlands has twice as many cattle as France. Butter is a large export to England; Edam cheese (Fig. 27), a specialty of the region west of the Zuider Zee, made in a few factories and in many hundreds of farmhouses, is found in most cheese markets of the world. As many as 200,000 Edam cheeses are sometimes in the market at Alkmaar (Fig. 102). Several millions of sheep graze in the meager pastures of the south and northeast.

The fisheries are important (Fig. 102 and p. 91). The oyster and herring are taken in large quantities; the oyster thrives in the alluvial mud brought down by the rivers, and is protected from the waves of the North Sea by the many islands along the coast. Dutch fishermen are also active in the cod and other North Sea and Iceland fisheries; many herring and anchovies (not the real anchovy of more southern seas, but sprats) are packed.

Timber and building materials are lacking. There are no large forests; the country is one of the principal buyers of lumber in the world, purchasing most of it from Russia and Scandinavia, but pitch pine from the United States. Coal and iron come mainly down the Rhine from Germany. If it were not for cheap ocean freights the Netherlands could use no stone for structural purposes, for it has no home supply.

Manufactures are not numerous (Fig. 104). Most of the elements for large industrial development are lacking. Coal and iron are brought to Amsterdam and The Hague from England and Germany for the construction of railroad material, ships, and hardware. Most of the industries are connected with the transformation of agricultural products, as liqueurs (curaçao), made from the orange peel grown in the Dutch island of that name and also in Spain; the famous Holland gin, distilled from rye at Schiedam and Rotterdam; manufactured tobacco and cigars, from home-grown or East Indies leaf at Amsterdam and Utrecht;

and oil, from imported oilseeds at Delft. A few towns, indicated in Fig. 104, produce woolen, cotton, and linen

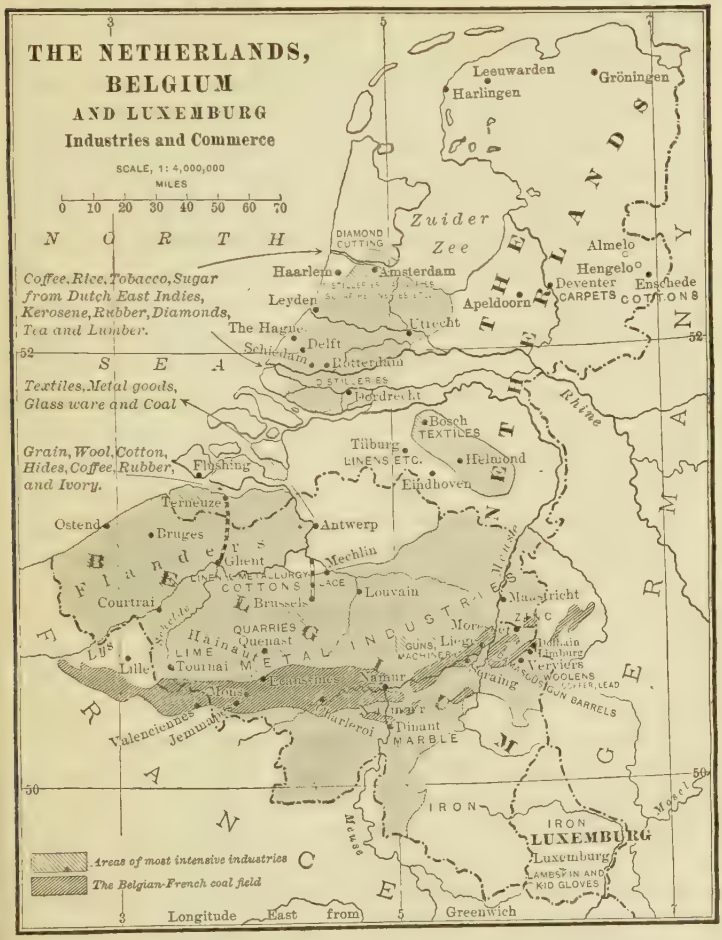

FIG. 104.

textiles. Diamond cutting, once a great industry in Amsterdam, handed down through generations of Jewish cut-

ters, is declining, owing to the competition of Antwerp, Paris, and London. Brick and tile, indispensable in a country without stone, are made in abundance; Delft still produces the glazed earthenware that long ago made the town famous.

Before England rose to industrial greatness Holland was pre-eminent in cloth manufactures and shipbuilding. The decline of the Dutch in political power, as well as their poverty in useful minerals, has caused industrial decline and pushed commerce and cattle-raising to the front.

The chief trade is in the import and re-export of colonial products. The Dutch East Indies, extending from Sumatra to New Guinea, are more than sixty times as large as the mother country and have seven times the population. They send four fifths of their sugar, tea, coffee, quinine, indigo, dyewoods, spices, gums, tin, and tobacco to Rotterdam and Amsterdam. Some of these commodities are largely enhanced in value by manufacture in the Netherlands, Java raw sugar, for example, being refined at Amsterdam, Java and Sumatra tobacco made into cigars, and quinine prepared for the market. These colonial products are sold by Dutch merchants in many lands. On the other hand, the colonies buy from the mother country great quantities of cottons and other manufactures made at home or imported for them. Excepting Europe, the colonies are the best customers of the Netherlands.

Most exports of home products go to neighboring countries. They consist mainly of butter, cheese, meat, and oleomargarine, England, Germany, and Belgium being the largest buyers. Exports of colonial products have a wider market; the United States buys Sumatra tobacco, chocolate, coffee, sugar, and South African diamonds cut and polished in Amsterdam.

Most imports for home consumption come from neighboring countries and the United States. The United States, sending wheat, flour, maize, rye, leaf tobacco, tallow, bacon,

lard, petroleum, and lumber, contributes about one eighth of the imports; Germany, Great Britain, Russia, and Belgium supply nearly all the other imports, chiefly manufactures, coal, timber, and metals. Most of the home trade, as distinguished from colonial trade, is with these European countries.

Large profit is derived from the forwarding trade. Both Rotterdam and Amsterdam receive great quantities of commodities from all the Rhine ports of Germany for shipment abroad. A great deal of American cotton and cereals go to these ports on the way to Germany. Steamboats ply between Rotterdam and South Germany, connecting there with the canal system leading to Marseilles. Tank steamers carrying American petroleum distribute it among scores of German towns; nearly all the Spanish and Swedish iron ore used at Essen is carried from Rotterdam up the Rhine. Other Rotterdam steamers ply to east Belgian towns on the Meuse; the Sud-Guillaume Canal connects the rivers of Holland with the river and canal system of west Belgium; thus Rotterdam is brought by waterways into close touch with Germany and Belgium. Amsterdam's connection by river and canal with the Rhine enables that city to take a large though inferior part in the transit trade. Switzerland, without ports, and Austria-Hungary, with only two, send to the Netherlands many industrial products, by water and rail, for shipment to other lands.

Rotterdam and Amsterdam are the most important ports (Fig. 104). They handle nine tenths of the sea trade, fully three fourths of which pertains to Rotterdam, whose trade has advanced by leaps and bounds since improvements in navigation in the lower Maas made Rotterdam wharves accessible to the largest vessels. The enormous trade of Rotterdam by ocean and inland water routes gives that port a total movement of 16,000,000 tons a year, which is double the movement of Marseilles. The North Sea canal (Fig. 27), opened in 1877, admits vessels of the largest

draft to Amsterdam. All canals and rivers are free to foreign as well as Dutch vessels, as the people do not place the slightest impediment in the way of commerce. It is a free-trade country, duties being levied on a few articles only for purposes of revenue. There is no coasting trade, as inland water routes are preferred.

The Dutch merchant marine being small, a little over half of the sea trade is carried under the British flag; but regular lines of Dutch steamships connect Rotterdam and Amsterdam with New York, the West Indies, Atlantic ports of South America, and the East Indies.

The railroads are of more importance for international than for internal commerce, the trade from one town to another being mostly carried by water. Railroads carry practically all the freight that England sends into Central Europe. Flushing on the Schelde, and Hook of Holland, near Rotterdam, are railroad ports on the main routes between England and Germany.

The merchant, the carrier, and the farmer are the leading factors in business. The foreign trade is twice as large as that of Belgium, though the latter country has more people

FIG. 105.—Subdivisions of the soil in the Netherlands.

and highly developed industries. Though the Dutch, in their low lands, lack some of the most important sources of wealth, their position at the mouth of the Rhine, their vast colonial empire, and their indomitable energy have made them a great commercial nation.

STATISTICS FOR THE NETHERLANDS

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS)

	1882–'86.	1892–'96.	1901.	1902.	1903.
Imports.....	448.5	602.5	815.4	867.3	1,129.5
Exports.....	342.5	490.0	695.8	732.9	872.9

TRADE WITH LEADING COUNTRIES, 1908 (IN MILLION DOLLARS)

	Imports.	Exports		Imports.	Exports.
Belgium.....	108.3	112.2	Germany.....	277.8	432.8
Dutch East Indies	162.1	35.6	Russia.....	110.0	5.6
France.....	13.8	6.4	United States....	129.5	81.2
Great Britain....	117.7	190.5			

Imports from the United States in 1901, $83,721,501; exports to the United States, $17,273,111.

Population (1908), 5,825,000.

Gold standard, with the florin (valued at 40$\frac{1}{5}$ cents) as the unit of coinage. Metric weights and measures.

NOTES AND QUESTIONS

Man's struggle against the sea is fierce whenever it threatens his domain. The constant work and watchfulness of the Dutch against the invasion of the sea is an object lesson to the world.

What short sandy shore near New York City has required strenuous efforts to prevent its destruction?

Name a part of the north sea coast of Germany where large protective works have been built.

This chapter shows the remarkable aptitude of the Dutch as farmers, mariners, colonizers, and merchants.

Do not such talents, combined with tireless industry and directed by cultivated intelligence, tend to make a nation great?

CHAPTER XXIV

SCANDINAVIA

The Kingdoms of Sweden and Norway occupy the largest peninsula of Europe. They were long united in one kingdom, but separated in the year 1905. The kingdom of Denmark is a part of the great, low plain of north Europe. The Danes and Norwegians speak practically the same tongue and both understand the older Swedish form of their closely related languages.

Sweden and Norway stand on a high plateau. The western mountain ranges have a marked effect upon climate and commerce, for as the west coast receives the warm, moist Atlantic winds, its fifty ports, scattered among the fiords, are open the year round. The mountains that shield them from the icy east winds of winter also deprive the eastern plain of the genial influence of the Atlantic. The west, therefore, has the sea climate and the east the continental climate (p. 7). All the east ports are closed by ice from three to five months. All farms, except strips of grain land in Norway fiords, are in the domain of the continental climate. Being in the latitude of Labrador, the growing season is short; the winter is long and cold; the rigorous climate and limited fertility prevent the cultivation of a large area (Figs. 106 and 107).

Half of the Swedes and a fourth of the Norwegians are farmers. The largest and most productive area of farm lands (Fig. 108) is in Gothland, where grain returns as much to the acre as in England; but although there is this

fertility in the southern part of Sweden, the kingdoms import every year, mainly from the Baltic countries, about 12,000 tons more breadstuffs than they produce, including a little wheat from the United States. The sugar beet

Fig. 106.—Subdivisions of the soil in Sweden.

thrives in the extreme south, but the sugar output is not equal to the demand.

Dairy products are important exports. The Swedes raise grain and butter for export, but the Norwegians are forced to import considerable quantities. The kingdoms formerly imported much butter, but since 1870 the herds have

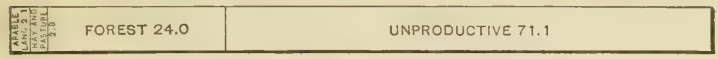

Fig. 107.—Subdivisions of the soil in Norway.

greatly increased, and millions of pounds are now exported every year from Sweden to Great Britain and other countries. Norway has only one third of the cattle, but the poorer pastures of Norway give adequate grazing for the larger part of the sheep; much wool, however, is imported for the mills of Sweden.

The fisheries are very important in both countries (p. 92 and Fig. 108). Three fourths of the catch is taken by Norwegian fishermen along the Norway coast, where cod, herring, mackerel, and the so-called anchovy, a variety of herring, are caught in vast numbers among the quieter waters in the lee of the islands. Salmon abound in the fiords and rivers of both countries. All the ports of Norway are fishing ports, but the greatest fishing center is the Lofoten islands, where 40,000 men and 7,000 small vessels are engaged in March, the busiest season of the year. Most of the cod and herring catch is cured on the islands, sent to the ports by steamer, and four fifths of it exported to the

large fish-eating countries of Europe. From 10,000 to 20,000 barrels of mackerel are packed every year.

Lumber and timber are the largest articles of trade (Fig. 108). Sweden has 5,000 saw mills, run by water power,

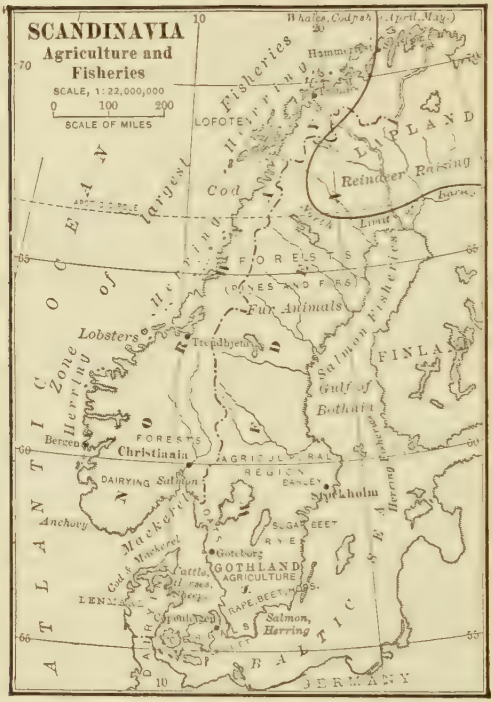

FIG. 108.—The largest mining interests are in the north, the forest industries are in the middle regions, and agriculture and stock raising are mainly confined to the area south of the sixtieth parallel. The fisheries extend along the entire coasts. Some thousands of Lapps or Finns live in Lapland; a part of them subsist by fishing (Sea Lapps), while the reindeer supplies food, drink, and clothing to the remainder (Reindeer Lapps).

and, because its markets are very convenient to importing countries of north Europe, is the largest lumber and timber exporting country in the world. The Norway pines and spruces, convenient to Christiania and other shipping

points, have been depleted in many places; the more northern forests in Sweden are now the greater source of lumber (p. 114). Lumber, timber, and naval stores, which are sent as far away as Australia, are nearly half the total exports of the kingdom.

Iron ore is the largest source of mineral wealth (Fig. 109). Nearly 5,000,000 tons are mined every year near Gefle, Falun, Dannemora, and other points, the largest supply coming from Gellivare, 130 miles north of the arctic circle. The most northern railroad in the world carries the Gellivare ore to the port of Luleä. As Baltic ports are closed in winter, a railroad has been completed (1903) from Gellivare to Ofoten fiord, northwest Norway, so that the ore may be delivered at all seasons to steel works in Great Britain and Germany. Magnetite and manganese ores for steel making abound; Swedish ores are now rivalling those of Spain in British and German markets. Rich silver, copper, and zinc mines are worked at places indicated in Fig. 109.

Göteborg is the most active port (Fig. 109). It is more conveniently situated than Stockholm for trade with all North Sea and many Baltic ports, and is therefore the largest center of imports, many of which are carried in summer by the river and canal route, 180 miles long, through Lakes Wener and Wetter to Stockholm (Fig. 109). It exports a great deal of lumber, wood pulp, grain, and fish. Stockholm, the capital, is the chief commercial center, and receives most of the wheat and flour imports, many imports through other ports being sent to Stockholm for distribution.*

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* Norrköping, south of Stockholm, important in sea trade, is also the leading industrial town; Malmö and Helsingborg export large quantities of cereals. The chief exports of Christiania, the capital of Norway, are lumber, destined for many parts of the world, and fish; a great deal of ice also is sent to England. The neighboring towns of Fredrikstad and Drammen are also timber ports. Bergen has the largest fish exports in the country, and receives much merchandise.

Inland waterways afford water power, but little navigation. Commerce is active, however, both on the southern lakes and on the river, lake, and canal route between Göteborg and Stockholm. Railroads are cheaply built, because of the small cost of land, lumber, and iron. Uninterrupted rail communications extend between Gellivare in the north and Malmö in the south, over 1,200 miles, or farther than from Boston to Chicago (Fig. 109).

Most manufactures come from foreign lands. The kingdom lacks coal, dense population, and capital required for large manufacturing development. Industries, however, are growing, but are still in a primitive stage.*

Sea enterprise is a large interest in Norway. Its people are a race of sailors; in proportion to population they have the largest merchant marine in the world (p. 48). Having comparatively small commerce of their own, their ships and crews take part in the trade of many other nations. Not a few of them are engaged in the fruit trade between the United States and Central America. The Norwegians buy from other nations much more than they sell to them; but from the apparent balance of trade against them must be

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Trondhjem, the starting point of steamers to the North Cape, is visited every year by thousands of tourists, who go by rail to this port to embark for the Land of the Midnight Sun.

* Wood is used to reduce iron ores at Dannemora, Norrköping, Eskilstuna, Motala, and a few other places in the Stockholm district, where home-made steel is employed in the manufacture of machinery, tools, hardware, and other articles. The first Scandinavian locomotive was built in 1893. The most important industries are derived from wood, including a great deal of cheap furniture and wood pulp. Shipbuilding is active at Stockholm, Gefle, and Göteborg. Matchmaking is a large industry, many tons of matches being sent to all parts of the world. Woolen and cotton factories at Stockholm, Norrköping, Göteborg, and elsewhere are far from filling the demand. Linen spinning and weaving, a house occupation, more nearly meet the textile requirements. Canning salmon is important at Bergen, Stavanger, and other centers. Breweries and distilleries are numerous; tanning leather is important in a country which raises so many cattle.

FIG. 109.—The most important Swedish railroad connects Stockholm and Göteborg, the leading ports. A number of branches north and south of the main line provide the more populous part of the country with adequate transportation. The most important of these branches connect the capital with Christiania on the north and Malmö on the south. Trondhjem (Fig. 13), a fiord port that never freezes, has become the winter port of Stockholm since the railroad across the peninsula was built. Observe the short branch lines from the northern railroad, which carry timber, naval stores, and iron and copper ores to small shipping ports on the Gulf of Bothnia. The most important of these ports is Gefle, the center of the Swedish forest industries.

deducted all the money they earn in carrying foreign freight (p. 158).

The kingdoms have only a few commodities to sell; they need to buy many things. The abundant product of the forests, fisheries, iron and zinc mines, dairies, and oat fields is sold abroad. They must buy coal, cotton, coffee, salt, and fruits, which they do not produce. To supplement the meager home production they require large imports of textiles, raw wool, machinery, railroad iron, hog products, and many other things. Nearly everything they buy comes from countries bordering on the Baltic and North Seas, the only lands with which they have direct steam communications; nearly all they sell goes to those countries. The United States has such commodities as the kingdoms sell much nearer at hand, and therefore imports from them only about $5,000,000 worth of goods a year. It sells to Sweden and Norway cotton, wheat, provisions, tools, machinery, fertilizers, locomotives, and leather goods worth four times as much as its imports.

Denmark, after the Netherlands, is the lowest country in Europe. Nearly surrounded by water, the moist sea climate prevails in summer; but the climate is distinctly continental in winter, when the winds from Siberia sweep over the frozen Baltic, which is only one fourth as salt as the ocean and freezes more easily. The western half, the Jutland peninsula, is continental, with fine pastures and also many peat bogs and sand wastes that form the unproductive area (Fig. 110). The eastern half is insular; it is the

Fig. 110.—Subdivisions of the soil in Denmark.

more valuable part of the kingdom, because it is more fertile, with fine waterways between the low, flat islands, making communications easy. All the harbors are Baltic ports, which freeze in winter.

Denmark is a dairying and agricultural country (Fig. 108). No land has achieved more remarkable progress in these industries. Most of the farms, containing only five to twenty-five acres, are owned by the peasantry, who, by scientific agriculture, have made the naturally sandy soil very fertile. Though large crops of cereals are raised, breadstuffs are imported; with about half the land in oats, hay, pasture, and root crops, which serve as provender for great numbers of horses, milch cows, and sheep, all the breadstuffs required can not be raised. Dairy products are the largest exports. In proportion to size, Denmark has more cattle than any other country in Europe. Farmers are required to produce milk, butter, and cheese under strict sanitary conditions, the cows being examined every month. Most of the milk is sent to over 1,000 steam butter factories, managed by an association to which nearly all the farmers belong, whose aim is to produce the very best butter and place it in foreign markets. This system has resulted in an enormous increase in butter production. Great Britain, the largest purchaser, buys over $35,000,000 worth every year. Other countries, especially tropical lands, buy it packed in air-tight boxes. Close attention is paid to the various demands of the markets, the butter sent to England, for instance, being light in color and salted but little, while that sent to Central America is yellow and very salt.

Numerous beef cattle are sent to foreign markets, though the meat trade is growing at the expense of live shipments, owing to British and German laws against live-stock imports. Horses, in high repute for cavalry and draft purposes, are a large export. Considerable wool is exported, but more is used in local mills. Agricultural societies control the enormous shipments of eggs, the members agreeing, under penalty of a fine, to deliver none but fresh-laid eggs (p. 203). The fisheries swell the country's exports considerably.

The timber supply is insufficient. The Danes, like the Dutch, have sacrificed their forests to increase the acreage of farms and pastures. Norway and Sweden supply most of the lumber. White oak (duty free) is imported from the United States.*

Industrial development is restricted by lack of coal or water power. Manufactures are only for local consumption. The most important branches depend for material upon agricultural products, as flour mills, beet-sugar works, distilleries, and breweries. Copenhagen and Odense make farm machinery; Copenhagen builds ships, and has large leather, machinery, and other industries. East Jutland towns have cloth and paper mills.

Copenhagen, the capital, is the only large port. It is the only harbor that can be entered by large vessels. Standing at the entrance to the Baltic, it is a distributing point for Baltic trade. A great deal of freight is sent to Copenhagen to be forwarded on smaller vessels to Sweden, Russia, and other Baltic ports. To facilitate this growing trade a free port was established in 1894 (Fig. 91). Steamship lines connect this port with north Europe, New York, and Bangkok, Siam. Aarhuus, the largest town in Jutland, and Aalborg, the commercial center of the north, are outlets for grain, cattle, and butter.

Imports are larger than exports. The foreign trade has been trebled since 1866, when dairying began to be important. Coal, textiles, timber, machinery, breadstuffs, and animal foods are the largest imports. Butter, eggs, meat, and live animals are almost the sole exports. Most of the trade is with north Europe and the United States. Large quantities of maize, wheat, oil cake, cotton, and an impor-

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* No minerals of importance are produced except chalk, celebrated for its purity, which is used in lime burning, glass, cement, putty, wall paper, and other manufactures. It is exported in large quantities to all Baltic countries.

tant amount of manufactures are imported from the United States.*

STATISTICS FOR SCANDINAVIA†

AVERAGE ANNUAL TRADE OF SWEDEN (IN MILLION DOLLARS)

	1881–'85.	1891–'95.	1900.	1908.
Imports	88.5	97.5	143.4	163.2
Exports	67.5	88.5	104.9	129.1

AVERAGE ANNUAL TRADE OF NORWAY (IN MILLION DOLLARS)

	1881–'85.	1891–'95.	1900.	1902.	1908.
Imports	40.5	59.5	83.3	77.9	100.8
Exports	28.5	35.0	43.6	45.6	64.3

AVERAGE ANNUAL TRADE OF DENMARK (IN MILLION DOLLARS)

	1881–'85.	1891–'95.	1900.	1902.	1908.
Imports	70.0	94.0	111.5	116.7	190.7
Exports	50.0	70.5	75.5	85.7	165.3

Population: Sweden (1908), 5,378,228; Norway (1908), 2,330,000; Denmark (1908), 2,630,000.

The monetary standard in the Scandinavian countries is gold, with the crown (26⅘ cents) as the unit of coinage; the metric system is authorized; old weights and measures that are still used are nearly the same as those of the United States.

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*Many sheep are raised on the Faroe Islands, one of the Danish colonies; wool, and feathers from the innumerable birds, are the chief exports. Iceland produces little but fish, cattle, and sheep, which are exported in large quantities. Nearly all the commodities consumed, not derived from these animals, are imported. Furs, hides, eider down, and seal oil are the exports of Greenland, whose trade is a monopoly of the Danish government. The mineral cryolite, found in commercial quantities only at Ivigtut, Greenland, is exported to Philadelphia for the manufacture of soda.

†The trade with the United States in 1908 was: Sweden, imports from, $16,155,000; exports to, $2,605,000. Norway, imports from, $4,852,000; exports to, $1,651,000. Denmark, imports from, $30,260,000; exports to, $6,641,000.

CHAPTER XXV

SWITZERLAND

Switzerland is the only important European country, except Servia, without seacoasts. It depends upon other nations for seaports and steamship lines, paying large sums of money to foreign transportation companies to carry all its external trade; yet, in spite of these disadvantages, it maintains an important and growing commerce with many countries. Another unusual fact is that, although this little republic, which is not quite one third as large as New York State, has scarcely any coal or iron, it has become an industrial country of the first rank. Its prosperity is due to certain great advantages which balance the unfavorable conditions that might otherwise keep the country poor.

Mountains cover more than half of the country. In the north are the Jura ranges (Fig. 111), with many vineyards and fields on the lower slopes, pastures rising above them, and scores of industrial towns in the valleys. In the south are the Swiss Alps, three to four times as high as the Juras, and covering this part of the country. These mountains are thinly populated and almost unproductive, except for the many thousands of cattle feeding on the high pastures in summer, and straw plait braided by the peasantry in the valleys. Walled steeply in between these northern and southern mountains is the central plain, about 1,300 feet above sea level, which is a plain only by contrast with the mountains around it; in other countries it would be regarded as an elevated, hilly region. Most of the people

live in the plain, which is as densely populated as France or Germany. The larger part of the inhabitants speak German, but Italian is the language of the southeast, and French is spoken in the western portion of the country.

The climate varies vertically, not horizontally. The plain is comparatively warm; it has larger rainfall (25 to 46 inches a year) than most other parts of Europe, because so

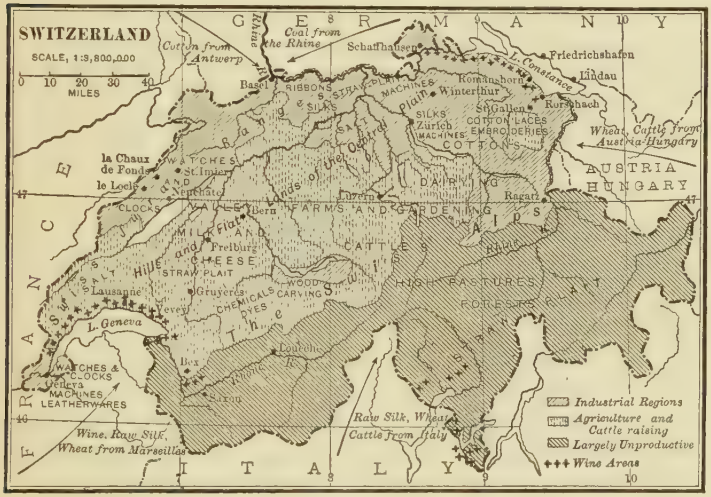

FIG. 111.—Industries and agriculture.

much vapor in the air is condensed in the cooler altitudes of the mountains. One half of the country lies above the zone of agriculture; snow fields, covering the ground above 8,500 feet, help the farm lands below, because their melting waters carry rock waste to enrich the valleys and the plain. Only the southern slopes of hills and mountains catch the direct rays of the sun (p. 15); vineyards and orchards are planted on these sunny slopes.

Switzerland derives less support from its agricultural resources than any country in Europe except Norway. Only

about one sixth of it, an area smaller than Oklahoma, can be tilled (Fig. 112), as the soil is not rich in plant food. Grain is raised only on the plain and in deep mountain valleys; the country imports from Russia, Hungary, and the United States nearly three times as much wheat as it produces. Fruit culture (mainly apples, pears, and cherries) is a much larger source of profit than grain. Orchards are planted everywhere in sheltered places. Wine culture is a

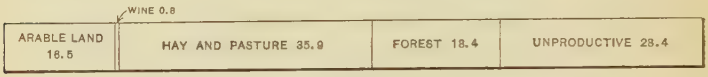

FIG. 112.—SUBDIVISIONS OF THE SOIL IN SWITZERLAND.

The unproductive area, more than a fourth of the entire country, is confined mainly to the snow-covered regions of the higher Alps.

widely extended and profitable industry, particularly in the warmer soil along the shores of Lake Geneva and some other lakes and on the southern slopes of the Juras and the southern Alps (Fig. 111); but a great deal more wine is imported from the surrounding countries than is grown in Swiss vineyards.

The widespread hay and pasture lands make animal industries more important than agriculture. Cattle grazing is the distinctive Alpine industry. As the snow melts in the spring tens of thousands of cows are driven to the highlands to feed there till the fall frosts compel them to return to their winter provender of hay. The herders milk the cows and make cheese and butter, cheese being the principal output. About once a fortnight supplies are taken to the herders and cheese and butter are carried down to the markets. Meanwhile the farmers in the plain are making hay for winter fodder. The cattle industry in the plain is also large, a great deal of condensed milk being manufactured there. Swiss cheese (Schweizerkäse) and Gruyère have a world-wide reputation. Butter-making suffers on account of the high price of cheese. Exports of cheese, condensed

milk, and milch cows are very important, but the import of beef cattle is still larger, amounting to about 60,000 head a year, with Austria and Italy as the main sources of supply. A great many sheep and goats (for kidskins and morocco leather) pasture in the highlands.

Forest industries are not so important as formerly. Leaf trees abound in the lower altitudes and firs and pines in the higher; but on account of the wanton waste of timber for many years past, the country now imports large supplies of lumber and fuel. The Government has introduced scientific forestry, and is replanting many denuded timber areas (p. 108). In many Alpine valleys the Swiss busy themselves during the winter making wood carvings to sell to tourists in the summer.

Mining is not important. Rock salt, found in three cantons, and building stone, particularly sand and limestone, are the most important mineral products. A little iron ore is mined in the Jura ranges, but not enough for the iron industries. An insignificant amount of anthracite is mined near Bern and Freiburg, but the people must depend upon wood and imported coal for fuel. It is the vast development of water power, derived from numberless mountain torrents, that has given Switzerland high rank as an industrial state, two thirds of the factories being run by water.

Over a third of the people are employed in manufacturing industries. Manufactures have been chiefly developed in the plain and among the Jura mountains (Fig. 111). The most important centers are Zurich, Bern, and St. Gallen. The variety of manufactures is small, the country relying chiefly upon a few branches that depend upon excellence of workmanship. There is no desire to produce a large quantity of cheap stuffs, but manufacturers aim to gain repute for the excellence and fineness of their goods. Their products, being comparatively high priced, can bear the cost of long-distance transportation to the sea for ex-

port; thus Switzerland has established large trade relations with many nations. A peculiarity of Swiss industry is the large amount of home work. Thousands of silk hand looms and embroidery machines in the Zurich and St. Gallen districts turn out the finest of products in the homes of the operatives; straw plaiting, watch and clock making, tobacco manufactures, and knitting are also carried on to an important extent in the homes.

Textile and metal industries are most important. The great center of cotton manufactures, which depend almost wholly upon machinery, is St. Gallen and the cantons immediately south of it. Swiss cotton cloths (made of American cotton, and noted for fineness of texture and excellence of dyes and prints) and raw and dyed yarns are sent all over the world. The silk industry, centered in Zurich, Basel, and their environs, does not employ so many hands as cotton, but the exports are even more valuable. Some raw silk is produced in the cantons nearest to Italy, but most of it is imported. The export trade suffers from American competition (p. 102). Woolen manufactures are far behind these industries; they figure in the foreign trade only in the imports.

The leading metal industries are the manufacture of watches and machinery. The centers of watch and clock-making are at Geneva, and in the Jura Mountains at Le Locle, La Chaux-de-Fonds, and other towns near Neuchâtel (Fig. 111). Geneva makes a great many watches in elaborately engraved cases, Le Locle turns out pocket chronometers, and the Jura towns make nickel and other plain watches. The industry long suffered from the serious decline in exports to the United States, as this country bought about $3,000,000 worth a year before its own factories cut off two thirds of the Swiss sales in America. More of the cheaper grades are now made in Switzerland, which still makes hundreds of thousands of watches, and exports five sixths of them. Machinery, made most exten-

sively at Zurich, Winterthur, and Geneva, has a high reputation and sells readily in other countries.*

There are no navigable rivers. Lakes Geneva, Neuchâtel, Luzern, Zurich, Constance, and a number of smaller lakes, embedded among the hills of the central plain, are of great importance in internal trade and in the carriage of commodities to the frontiers for exportation. The railroad system is unsurpassed (Fig. 113); the railroad mileage in the plain, in proportion to area, is greater than in any other country of Europe except Belgium. Since 1898 passenger rates have been extremely cheap; a second-class ticket costing $13.51 entitles the purchaser to travel as much as he pleases, for thirty days, over all Swiss railroads and on the lake steamers. Fine wagon roads follow all the valleys and cross the three important passes—Great St. Bernard, St. Gotthard, and Simplon, and several of the minor routes over the mountains. The connections with the leading seaports, both of north and south Europe, are so excellent that all of them, from Amsterdam to Marseilles and Genoa, are utilized to a greater or less extent in the Swiss foreign trade. Most of the wheat and flour from the United States enters at Marseilles, and is forwarded by rail to Geneva. Coal and iron from Germany are sent up the Rhine by boat and rail.

The neighbors of Switzerland figure most largely in her foreign trade. It is to the advantage of this land without seaports that she has on her borders great trading nations like Germany, France, Italy, and Austria-Hungary. They buy large amounts of her superior manufactures, and sell her many of the manufacturing and food materials she

* The making of straw braid for hats (Fig. 111) employs 70,000 workmen; the industry has strong competition in Chinese and Japanese braid. Chemicals, wood engravings (from the Bernese Oberland), leather goods, and scientific instruments are exported to a considerable extent. Flour mills, breweries, pottery and glassworks, and jewelry factories produce mainly for the home trade.

lacks. The largest imports are grain, cattle, and other food supplies. Italy and the Orient send raw silk, which is next in importance. As Switzerland has no gold and

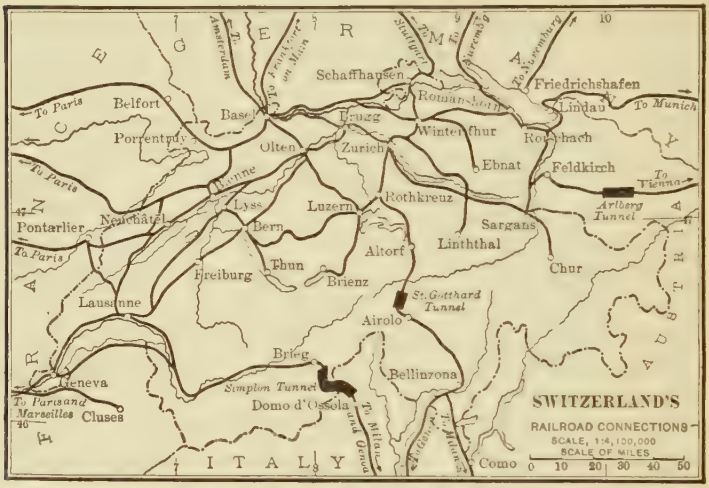

FIG. 113.—Five railroads crossing the Jura Mountains connect with through lines to the Atlantic and North Sea ports of France, Belgium, Germany, and the Netherlands. The route from France to Austria through Basel and Zurich passes through the Arlberg tunnel, six and a half miles long; the greatest international route passes *via* Basel and Luzern through the St. Gotthard tunnel, nine and a quarter miles long, to Milan and Genoa; the Simplon tunnel, twelve and a half miles long, just pierced (1905), gives Paris the most direct communication with Milan, the largest center of Italian trade. Observe the routes from all the frontiers leading to the ports and commercial centers of the surrounding countries.

Geneva, standing at the point where the Rhone River leaves Lake Geneva, is a distributing and forwarding city: the convergence of railroads at Basel make it a very important commercial center and forwarding point; Zurich is the largest, most beautiful, and industrially active city.

silver mines, the quantities of precious metals imported for coinage and for jewelry and other manufacturing purposes sometimes surpass in value the large supplies of coal purchased abroad. Germany sells to Switzerland coal, coke, raw and manufactured iron, sugar and other foodstuffs, machinery, books, and many other supplies in such enor-

mous quantities that nearly a third of the total imports come from that country. Raw cotton, wheat, and petroleum comprise about two thirds of the value of imports from the United States.

Nearly all the exports are manufactures. Silk goods head the list; after them come cotton yarns, cotton cloths, which are sent wherever there is a demand for the finer grades of white and colored cottons and prints; books, engravings, embroideries, watches, and watch movements; machinery, much of it for spinning and weaving; milch cows, cheese, and condensed milk. Butter, wood carvings, and straw wares have a subordinate part in the exports. Cotton embroideries, the largest export to the United States, are worth more than double the raw cotton that Switzerland buys in this country. Silk goods, cheese, aniline dyes, and watches are also important exports to the United States.

Switzerland's great advantages are water power, excellent manufactures, near-by markets in which to purchase raw and sell manufactured products, and extensive communications with seaports. These advantages serve to counterbalance distance from the sea, poverty in coal and iron, and inadequate home supplies of food. The Alpine scenery also is a money-making resource that goes far towards supplying food and manufacturing materials that must be purchased from other countries.

Scenery is a large source of wealth. Millions of tourists visit Switzerland to enjoy its incomparable mountain landscapes, waterfalls, and glaciers. It was estimated that in 1898 they left $38,000,000 in the country. Most of the tourists come in excursion parties from Western and Central Europe. They remain only a short time, but their numbers are so large that the aggregate expenditure is enormous. However, as Switzerland imports nearly all the supplies it sells to tourists, a great deal of the money received is paid out.

STATISTICS FOR SWITZERLAND

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS)

	1885–'86.	1891–'96.	1901.	1902.	1908.
Imports	149.0	189.5	202.6	217.8	287.0
Exports	134.0	140.0	161.5	168.7	200.4

TRADE WITH LEADING COUNTRIES, 1908.

	Imports.	Exports.		Imports.	Exports.
Germany	102.5	47.9	Africa	4.4	2.5
Austria-Hungary	19.7	12.9	Asia	7.2	7.8
France	56.5	23.4	United States	11.7	24.7
Italy	34.3	18.4	Netherlands	3.4	1.6
Great Britain	17.4	35.7			

The United States purchased, in 1905, fine Swiss cotton goods to the value of $11,927,000, and silk goods worth $5,804,640. Switzerland's purchases from the United States amounted to $10,986,403. The rapid growth of Switzerland's trade is a tribute to her industry and the excellence of her manufactures.

Population (1908), 3,559,000.

The monetary standard is gold and silver, with the franc as the unit of coinage. Metric weights and measures.

NOTES AND QUESTIONS

Flowers are in profusion. An active and thinking people will always turn such a fact to good account. There are 250,000 beehives in Switzerland, and Swiss honey is justly celebrated.

In this age of coal Switzerland, without coal, could not have attained eminence in manufacturing if the people had not studied how to apply water power in the most scientific manner.

The soil is poor. This is the reason why the working men are content to get along with small wages. So manufactures are cheaply produced and can be sold at attractive prices; and as Switzerland must live, not by agriculture, but by commerce, this fact stimulates foreign trade.

The people being poor, what is the natural effect on internal trade?

Do not the statistics on this page show that the foreign trade, in proportion to population, is extraordinarily active?

CHAPTER XXVI

AUSTRIA-HUNGARY

No other large European nation has such a mixture of races as Austria-Hungary. The Germans are the largest element; many languages are spoken, the predominant tongues being German in Austria, and Magyar in Hungary. Political antagonism, growing out of racial differences, sometimes disturbs business. Strife, in recent years, between the Czech and German nationalities in Bohemia, the most industrial province, has resulted, for example, in the refusal of many Czechs to trade with German merchants or to buy German goods.

Mountains and highlands wall in most of the empire, and inclose the great low plain of Hungary. The Galician lowland, however, borders Russia; and on the southwest there are 465 miles of coast washed by the Adriatic. Sharp contrasts in topography help to produce wide variations in climate, arctic conditions prevailing on the highest mountains, Atlantic influences, which penetrate even to the Tyrol valleys, modifying summer heat and winter cold in the west. The flat pusztas, or plains of Hungary, have the continental climate, with extremely hot summers and severe winters; the Adriatic provinces of Istria and Dalmatia have the mild winters and dry summers of other Mediterranean lands. Only the Alps have large rainfall; the plains of Hungary are liable to droughts; therefore the quantity of wheat produced varies enormously.

River valleys, mountain passes, and the short seacoast give easy access to other lands. In favorable stages of the

water the Elbe is navigable from above Prague, in Bohemia, to Hamburg (Fig. 90). The valleys of the Morava and Oder rivers open a passage from Vienna to German Silesia (the Moravian Gate, p. 23). The Semmering pass and tunnel, southwest of Vienna, are the gateway through the mountains to Trieste, Venice, and Genoa. Vessels ascend the Danube into Germany, and the improvement in navigation at the Iron Gate, on the lower Danube, has opened a waterway from Vienna to all the Black Sea countries. A railroad over the Brenner Pass leads north into Germany and south into Italy; not far away is the Arlberg tunnel, through which Austrian trains reach Paris, Geneva, and Marseilles (Fig. 118).

The Danube River system affords great facilities for inland navigation (Fig. 118). The conspicuous service which the Danube renders is to connect southeastern with central Europe. Although the second largest river of Europe, it is inferior to the Rhine for transportation, because its outlet is on an inland sea far from great international centers of trade.

The empire is pre-eminently agricultural. Three fifths of the entire area is devoted to field crops, pasturage, and hay (Fig. 114), and more than two thirds of the people till

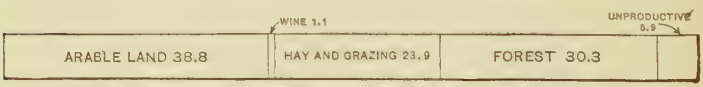

FIG. 114.—SUBDIVISIONS OF THE SOIL IN AUSTRIA-HUNGARY.

Practically all the land is utilized except the snow mountains, marshes along the Hungarian rivers, and the barren Karst, a limestone cave district back of Trieste, denuded of its timber and hence stripped of its soil by floods.

the soil or raise stock. Owing, however, to high freight rates and the competition of other grain-raising countries, which has reduced the price of grain, more and more of the population are abandoning agriculture for industries and commerce. Nearly all the arable lands in Austria are now cultivated, but millions of acres on the wide, flat plains

of Hungary still serve only for pasturage (Fig. 115), and the yield of cereals per acre is far less than in western Europe.

Wheat is raised in most parts of the empire, but thrives best in the alluvial lands of Hungary, which are enriched by the floods of the Danube and its tributaries, making the

FIG. 115.

plain one of the great granaries of the world (Fig. 36). More than enough wheat is raised for home consumption, and in good crop years a large quantity is exported to other European countries. The empire leads Europe in the manufacture of flour, Budapest being the largest milling center, while mills are scattered all over the wheat-growing districts, mainly in Hungary and Bohemia. The best mechanical inventions are used in the mills; wheat is classified for milling in seven grades, the uniformity of whose product contributes largely to the success of Hungarian flour, which brings a high price abroad.

Rye is raised in the cooler mountain districts; rye flour is the chief import of breadstuffs, selling readily, because large numbers of the working classes are too poor to eat wheat. Maize, a large crop in the south, thriving even in the Tyrol, is augmented by imports from the United States and Rumania. Enormous crops of oats are grown in the north of Austria and in Hungary. Flax and hemp are, however, losing ground, on account of Russia's superiority in these fibers.*

Wine culture is one of the large resources (Fig. 115). It is distributed through the southern half of the empire, Hungary, whose wines are among the most esteemed in the world, making nearly half the output. Tokay is the best known Hungarian wine and the leading export, the Government encouraging the industry by maintaining schools of instruction in grape-growing and wine-making. Much Italian wine has been imported since the phylloxera ravaged the vines; imports still exceed the exports.

A fourth of the area is in pastures. More horses are raised than in any part of Europe except in Russia. Great

* The empire is one of the large tobacco-raising countries, Hungary producing nearly half the crop. Tobacco, salt, and gunpowder are Government monopolies, their importation, except by the state, being prohibited. Bohemia and some other regions make a great deal more beet sugar (Fig. 44) than the country can consume; sugar is the largest export, England taking four fifths of the foreign sales; the state pays a bounty of sixty to ninety cents for every 220 pounds produced. Bohemia supplies four fifths of the hop crop. Brewery interests in all countries import more or less Bohemian malt or hops, whose superior quality is due to peculiarly favorable soil, climate, and methods of cultivation. Beer production has increased in the past half century about sevenfold, the most famous products coming from Bohemia and Vienna. Pilsen and Vienna beers are sent all over the world. Great crops of potatoes are raised, Austria producing far more than Hungary. Fruit raising is a large industry, the apple and pear thriving in the north; Hungary produces prunes, from which brandy is made; the southern provinces make olive oil and raise the fig, the olive, citrus fruits, and the almond nut.

herds of Hungarian horses graze on the treeless, grassy steppes. Hungary is also famous for fine mules. Hungary and Galicia raise the most stall-fed cattle for market, many of which are sold in Switzerland; Alpine cattle, fed in the high pastures, as in Switzerland, are kept for dairying. Sheep have declined with the large importations of Australian and South American wool. Poultry raising has enormous extent in the dry, limestone areas. Two billion eggs a year are exported to other European lands.

Forests are a large source of wealth (Fig. 115). Most of the wood products are now derived from the Carpathian forests and Bohemia (p. 114). A great deal of lumber and staves for making wine and beer casks are sent to France, Italy, and Germany.

The mineral wealth is large (Fig. 116). Mining is not developed in proportion to the great mineral resources. The coal production, half of which is taken from the rich Bohemian mines, is not quite equal to the demand; the next largest sources of coal are Moravia to the north and Styria to the south of the Vienna industrial district (Fig. 58). Iron ores are specially pure in Styria and Carinthia around Gratz and Eisenerz, where there is a mountain of pure iron ore; unfortunately, the best ores are nearer supplies of lignite than of coal, the fine Styrian ores being worked only with charcoal, while the poorer ores around Steyr are fused with coal.

Manufactures are of subordinate importance (Fig. 116). The reasons are the slow introduction of new machinery, high freight rates, heavy taxes on manufactures, the situation of industrial centers remote from the ocean, and race animosities. As the largest industrial development is in the northwest and north, the greatest density of population is naturally there (Fig. 117), while agriculture predominates in the east and commerce in the maritime provinces; but metal, machine, leather, and other industries are growing in Hungary. Textiles are most largely grouped on the north-

ern coal field at Reichenberg, Pilsen, Brünn, Troppau, and other towns. These manufactures, though most important of all, do not make enough cottons for the home demand.

FIG. 116.—The lead mines of Bleiburg are the richest in Europe. The quicksilver mines at Idria are surpassed in Europe only by the Spanish mines at Almaden (p. 138). The empire excels all other European countries in salt resources, though not in the quantity produced (p. 138). The most remarkable development is in the mines of Wieliczka-Bochnia, in Galicia, where the mass of rock salt is 300 miles long and 1,200 feet thick. Thirty miles of galleries have been dug into this mass, and mining villages stand far below the surface. Petroleum is produced in Galicia, but so much cheap Russian kerosene is imported that small use is made of the local oil resources. The map shows the distribution of gold, silver, and copper, none of which is very important.

Enormous quantities of grain and other freight are carried on the Theiss, Drave, and Save, tributaries of the Danube. New canals are being dug (1901) between the Theiss and Danube and the Drave and Save to shorten the distance by water to Budapest and Vienna.

The woolen mills export cloths, but import large quantities of worsted yarns. Large carpet manufactures and the silk industry have their principal seat in Vienna. The metal industries are centered mainly at Steyr, Gratz, and Klagen-

furt. Machinery, tools, and railroad materials are large products of Vienna, Gratz, Prague, and Brünn. The famous Bohemian glass is made near forests that supply fuel, potash, the silica and "coloring metals," which give it distinctive qualities, the mountain regions of northwest Bohemia having half the glass factories of the empire, with the largest centers at Pilsen and Eger. The leather industry is most highly developed in Vienna, Prague, and

Fig. 117.—Density of population in Austria-Hungary.

The most populous area is the district around Vienna, where the largest metal-working and general manufacturing interests of the empire are centered. The population is also very dense farther north, in Bohemia and Moravia, where agriculture is subordinate and most of the population work in the factories and shops. The Galician plain is more densely peopled than that of Hungary because farming and stock-raising are supplemented there to a greater extent by mining and manufacturing.

the Tyrol. It includes large glove manufactures. Sheep and lambskins come mainly from Hungary; goatskins from the Balkans and Mediterranean countries. Austrian gloves are among the large exports.*

* Vienna, Prague, and Budapest are noted for fine cabinet work and wood-turning; Austrian bent furniture and wooden toys are large

Railroads are less developed than in most European countries (Fig. 118). The railroad mileage is only a third as large as that of France. All railroads converge upon Vienna and Budapest; four fifths of the ocean freight is trans-

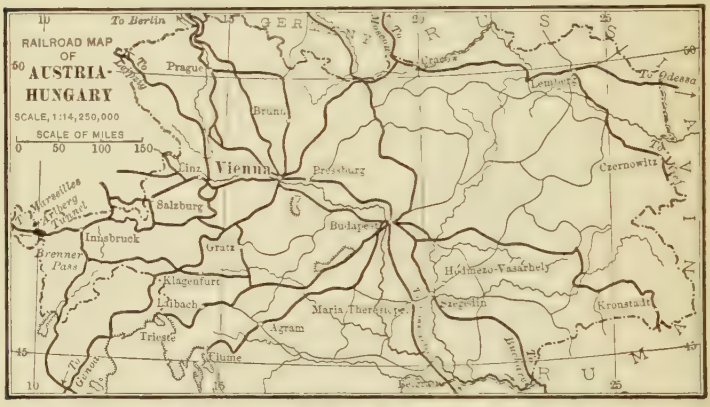

FIG. 118.—Vienna, the central point of trade between the upper and lower Danube and between east Germany and the Adriatic, is the greatest commercial and industrial city of the empire. Budapest, in the heart of the country and at the lowest place on the Danube where the river might be easily bridged, is the gateway of Hungarian trade. Prague lies on both sides of the navigable Moldau-Elbe, at the natural meeting point of all trade routes in Bohemia, and is therefore the collecting and distributing point for the coal, textile, glass, hardware, and other manufacturing interests of that region. Lemberg and Cracow are the centers of Galician industries and trade relating mainly to grain, cattle, salt, and petroleum. At Pressburg is the largest dynamite factory in Europe.

ported by the rail routes, because the rivers do not lead to the seaports. Commerce with the Levant takes Danube

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exports; a great deal of paper is made in the Vienna manufacturing district; the largest distilling interests are in Galicia and Hungary; the cordial maraschino is a product of Dalmatia (Adriatic coast). Austria excels in the manufacture of musical instruments, carriages, and many branches of hardware; the chemicals produced do not fill the home demand; many wooden vessels for the fisheries and rivers are built in the shipyards of Vienna, Trieste, Pola, and Zara. Compare Fig. 116 with 117 to note the relations between the distribution of industries and density of population.

steamers to the Black Sea. International routes through the Balkans lead from Belgrade to Constantinople and Salonica on the Ægean Sea. The merchant marine is one of the smallest in Europe (p. 48), most of the sea trade being through Trieste, the port of Austria, and Fiume, the port of Hungary. Trieste, the largest seaport, is the headquarters of the Austrian Lloyd, a maritime company, whose steamers ply chiefly to Oriental countries and Mediterranean ports. Two lines make regular sailings to the United States. Fiume is the outlet for a great deal of the wheat of Hungary. Cattaro (Fig. 116) is a better harbor than either Trieste or Fiume, but its situation is not convenient for trade. English and Italian vessels take an important part in the carrying trade, and the ports of northwest Europe receive and dispatch considerable of the foreign commerce.

Cotton and wool fibers, yarn, and cloth are the largest imports. Coffee, coal, metals, and machinery are also large purchases. Germany is the largest purchaser of exports, buying cereals and machinery. The trade with Germany tends, however, to diminish, as Germany can buy meat products and grain to equal advantage from America and Russia. The trade with Russia is somewhat restricted by the fact that both countries are large producers of cereals, cattle, and timber. About four sevenths of the foreign purchases are raw or partly manufactured materials, and the balance is manufactures. Cotton, maize, hog products, and pig iron are the largest imports from the United States, but Egypt supplies two thirds of the cotton.

Sugar, timber, cattle, wheat, leather goods, eggs, coal, and glass are the largest exports. Italy depends chiefly upon Austria for its coal supply. In the markets of the Levant, Austria-Hungary disputes the first place with England. She supplies Servia and Rumania with a large part of their imports, and controls the foreign trade of Bulgaria. She usually buys from the United States a larger

value of commodities than she sells here. The chief exports to this country are glassware, gloves, sugar, porcelain and pottery, musical instruments, and beer.

Austria-Hungary is a land of transition from industrial west Europe to agricultural east Europe. The internal trade illustrates this fact, most of the manufactures being derived from the west of the empire, and foodstuffs and timber from the east. When more coal is mined and the volume of manufactures is greater the country will not draw so largely as at present upon supplies from Germany and other sources. The empire is the only large European state that has no possessions outside of Europe.*

AVERAGE ANNUAL TRADE OF AUSTRIA-HUNGARY (IN MILLION DOLLARS)

	1876–'80.	1880–'85.	1891–'95.	1901.	1903.	1908.
Imports.....	234.0	257.5	277.0	335.5	423.0	486.8
Exports.....	273.0	302.0	321.0	383.7	466.0	457.8

IMPORTS FROM LEADING COUNTRIES IN 1908 (SPECIAL COMMERCE, IN MILLION DOLLARS) †

Germany.	Great Britain.	United States.	Italy.	France.	Switzerland.
198.9	44.0	44.3	23.5	16.4	13.6

EXPORTS TO LEADING COUNTRIES IN 1908 (SPECIAL COMMERCE, IN MILLION DOLLARS)

Germany.	Great Britain.	Italy.	Switzerland.	France.	United States.
209.4	46.8	45.6	18.4	13.1	11.6

* Bosnia and Herzegovina have been occupied and administered by Austria-Hungary since 1878 and in 1908 became a part of that Empire. They have made much progress under the new régime, which has built good highways and narrow-gauge railroads and begun the development of coal mining and manufactures. The trade is with Austria-Hungary, the exports being mainly oak timber, plums, and cattle.

† General commerce = gross imports or exports. Special commerce = imports for home consumption or exports of native produce and manufactures. The statistics in this book usually relate to special commerce.

Population with Bosnia and Herzegovina (1908), 50,499,000.

The standard coinage is the crown, based on the gold standard and worth about 20⅓ cents. Twenty-crown gold piece = $4.06. Metric systems of weights and measures are legal, but the old standards are often employed.

NOTES AND QUESTIONS

Why is the development of the chemical industries most active in the mineral and coal regions?

Racial dissensions are the chief reason why the people, as a whole, are not yet able to apply as skilfully as the French and Germans do the best scientific method in their activities.

The wine-growers of the empire produce four times as much wine as those of Germany do, but the value of the product, per acre, is much less than in Germany. Why?

As the empire has insufficient development in manufactures it is not yet able to rank in commerce with the other large European powers.

The development of an industry in one country is sometimes greatly retarded by its prosperity in another country. Can you recall any instances? Here is one illustration of the fact:

The development of the petroleum fields in Austria-Hungary is handicapped by Russia's enormous and cheap production.

CHAPTER XXVII

ITALY

Nature made Italy an agricultural and commercial country. Its industries can not rank with those of great manufacturing nations, because it has no coal, but it is fitted, like China, to support a great farming population, because it produces all the various crops of Europe, and many of those of tropical lands, under a climate so genial that two or three harvests may be gathered every year. Its position also adapts it for large sea trade, because it is part of the shortest route from west and central Europe to the Levant and eastern countries. The ports of no other land can communicate so easily with the coasts washed by the Mediterranean and the Atlantic and Indian oceans. On the land side it has close and quick connections with the rest of Europe. Though separated from the northern lands by the Alps, they are not a barrier to Italy's commerce; four lines of railroad cross the mountains; another will be added upon the completion of the Simplon tunnel (Fig. 113).

Most of the important towns are seaports. As Italy has the sea on three sides and is in the center of the most important inland sea in the world, it is natural that many of the inhabitants should be sailors, and the coast towns important in sea trade. The chief harbors are Genoa, Naples, Venice, Leghorn, Messina, and Palermo (Fig. 119). Enormous sums have been expended in improving these and other harbors. All the ports receive heavier and bulkier freight than they ship, because they bring in grain, coal, iron, timber, and other heavy commodities, while they ship olive oil, wine, straw goods, fruits, and other things of larger value, in pro-

FIG. 119.—Genoa is the harbor nearest to Switzerland and southeast Germany *via* the St. Gotthard tunnel; it therefore competes with Marscilles for northern trade; it is also the natural outlet of the Lombardy industrial district. The opening of the Suez Canal (1870) and of the Mont Cenis tunnel (1871) made a new era for Genoa, which has the lion's share of Italy's sea trade. Leghorn, the port of Florence, suffers from proximity to Genoa; the wines of the north and Carrara marble are among its shipments. Piombino receives the iron ore of Elba island. Most of the trade of Civita Vecchia, the port of Rome, is coal and pig iron for the interior. Naples, with 596,000 inhabitants, needs to import many articles for local consumption; many vessels in the Genoa trade call at Naples. At Brindisi overland freight and passengers take the sea route for the Orient. Barletta exports the cereals, wines, oil, and fruits of the southeast. Ancona is, next to Venice, the best Adriatic harbor. Venice is the outlet for the east half of the Lombardy plain; here grain is stored in air-tight pits to await shipment; its trade is only about one fifth that of Genoa. Palermo is the largest city and the chief port of Sicily. Messina commands the trade across the strait between Sicily and the mainland. Catania, Licata, and Porto Empedocle (the harbor of Girgenti, which has the largest sulphur mines in the world) export sulphur and citrus fruits. Marsala is a wine port for the famous vineyards around it.

Milan is the largest commercial and industrial center of the kingdom. Most of the roads across the Alps converge upon the city. Turin is on the route to France *via* the Mont Cenis tunnel, and has very large trading and manufacturing interests.

portion to weight and bulk, than the imports; the result is that many vessels landing cargoes depart in ballast.

The climate is dry and warm. The mountains encircling the Lombardy plain ward off the west and south winds, so

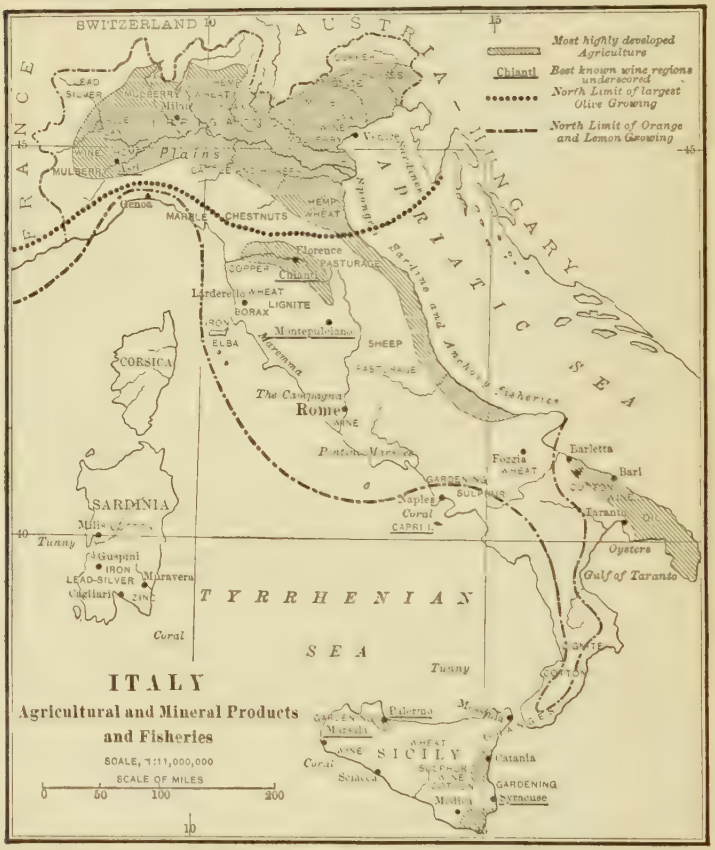

FIG. 120.

that the fields would not receive all the moisture they require if they were not irrigated; the largest rainfall in the south occurs in the fall and winter instead of in the

growing season; irrigation is, therefore, employed in nearly all parts of the kingdom. The Lombardy plain has greater extremes of temperature than the peninsula, which is imbedded between warm seas. The greatest drawback is malaria, that pervades the valley of the Po, the swampy lands of the Maremma, the Campagna, the Pontine Marshes, and some other regions (Fig. 120).

FIG. 121.—The population is more dense than in any other large state of Europe. It increases less rapidly, however, than in England, Russia, and Germany. The north surpasses the peninsula both in density of population and in the well-being of its inhabitants. The great industrial districts around Milan and Turin (Lombardy) and Florence (Tuscany) attract many thousands of artisans.

The largest industrial and agricultural development is in the north (Fig. 120). The reason is evident when natural conditions are studied. The largest and richest farming area is the Lombardy plain, lying within the bend formed by the Alps as they circle southward to join the Apennines. It is the basin of the Po River, fed by many Alpine streams, which irrigate the rice and other crops. The Po and its tributaries afford about 600 miles of navigation, while the more southern rivers have little utility, except the Arno, navigable to Florence, and the Tiber, to Rome. The north is much nearer the large trading nations than the south; farming and manufacturing are easier in the plain than in the mountainous peninsula. These facts have helped to give the north a more dense population and to make business of all kinds more active there (Fig. 121).

Agriculture is in a backward condition (Fig. 122). Most of the land, which is in the hands of large proprietors, is leased to small tenants, who, after paying all charges, have

Fig. 122.—Subdivisions of the soil in Italy.

but a scanty living. Progress is retarded by the fact that nonresident owners hold so much of the farm lands, and, as in Ireland, many of the peasantry seek to better their condition by emigration; 300,000 to 500,000 a year pass through Genoa or other ports on their way to South America or the United States; many thousands, also, eke out their income by working as farm hands or laborers in neighboring countries for several months every year. While more than a third of the land is tilled, millions of acres are unproductive which, if drained, would yield large crops and decrease the purchases of food in foreign lands.*

* Winter wheat, though widely grown, is in insufficient supply; large quantities are imported from Russia and Hungary for bread and alimentary pastes. Maize, raised everywhere, is a particularly large

Flax and hemp are large crops in the north, considerable hemp being exported. Excellent cotton is raised in the south and in Sicily, but the mills depend chiefly upon foreign supplies. Tobacco, a Government monopoly, is not grown in sufficient quantity, and much tobacco is imported from the United States.

Wine, olives, and citrus fruits are the staples of agricultural trade (Fig. 120). The uniform warmth and dry weather needed by the vine is found in most parts of Italy, hence the grape is cultivated everywhere, Italy being the second largest producer of wine (p. 69). The proportion of wine lands to the total area is greater in Italy than in France. The quality has much improved in recent years, and the exports are very large, Chianti, grown near Florence, Asti in the northwest, and the Marsala wines of Sicily being among the largest sales abroad. Olive oil * is surpassed in the foreign trade only by raw silk. The olive grows everywhere south of Florence; the best oil, from Lucca and other places near the north limit of cultivation, is first in United States markets, but the middle and south of the peninsula supply the largest quantities. The orange and lemon trees number over 17,000,000.† About 100,000,000 olive trees.

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crop in the north; polenta (Indian corn mush or hasty pudding) is the basis of food for the peasantry; the basin of the Po produces more rice than any other part of Europe; other cereals are of less importance; the climate is very favorable for vegetables, which are much more important as food than meat; as many poor persons subsist almost wholly on boiled chestnuts, the chestnut is the most important forest tree of Italy. There are many chestnut plantations.

* The olive tree is one of the most important products of Mediterranean lands, its original home. The tree lives for six or seven centuries, and is grown most largely in Italy, south France, Spain, Turkey, and Syria. The oil frequently replaces butter, and is preferred for salads in all parts of the world. In making olive oil the olives are pressed as in a cider mill, eight and one half pounds of olives being required for a quart of oil. The pickled fruit is a table delicacy.

† Citrus fruits come from a small genus of trees of the orange family, including the orange, lemon, lime, and others. Oranges and

The demand for lumber and timber is not covered by the home production. In the Po basin and in Sicily large forests have been recklessly destroyed.

Animal raising is of inferior importance. It is mainly developed in the north. Cattle in large numbers graze on the rich grass of the Po valley. Some of the cheeses of the Lombardy plain are widely known and figure in the exports. The army is not able to obtain all the horses it needs in the home markets, the breeding of donkeys and mules, particularly in the peninsula, being a larger industry. The best wool is grown in the mountain pastures of the Abruzzi (middle of the peninsula) and in Sicily, but only half the wool manufactured is supplied by the sheep farmers. As in all mountainous countries of Europe, thousands of goats are raised mainly for kidskins and morocco leather.

In comparison with northern peoples, the Italians eat very little flesh. Enormous quantities of fish, however, are consumed in this Roman Catholic country; over 80,000 men are employed in the fisheries all around the coasts (Fig. 120), but, as they are not able to supply the demand, a great deal of canned cod, pickled herring, and other fish is imported. The coral * and sponge fisheries are also important (p. 88). Poultry is raised everywhere, being next to mutton the preferred animal food; the export of eggs is very large.

Nearly 600,000 persons are engaged in raising the silkworm. It is the most important branch of rural industry

lemons are imported into northern countries from Mediterranean lands, Portugal, and the Azores, but most of all from Sicily. Orange culture in California and Florida and the duty on oranges and lemons have reduced Sicily's American trade. Limes come chiefly from the West Indies.

* The red coral of commerce is obtained in the Mediterranean off the coast of Africa and the west coast of Italy. The price varies according to color. The finest rose-pink in large pieces is valued at $400 or more an ounce. The common article brings $1 to $1.50 an ounce.

and the source of Italy's largest exports. Climate and soil are admirably adapted for the mulberry and silkworm. Italy holds the first rank in Europe and the third in the world (after China and Japan) in the production of raw silk (Fig. 55). Lombardy, Piedmont, and Venetia (Fig. 123) produce more than three fourths of the entire crop, and Lombardy alone two fifths, but it is raised to some extent throughout Italy, Piedmont producing the best quality. Most raw silk is sent to Milan, which is the principal market. All European and most American manufacturers buy a great deal of Italian raw silk, which is exported through Genoa or over the international railroads.

There is little mineral wealth. Though there is no coal, a few hundred thousand tons of lignite mined every year supplement the coal imported from Cardiff and Austria. Elba and Sardinia have excellent iron ore, which is not yet fully utilized. Boracic acid, of importance in the manufacture of borax, is found native in the lagoons of Tuscany. Salt is obtained by evaporating sea water or mining rock salt. Of Carrara marble (Fig. 119), which for many centuries has been preferred by sculptors to any other marble, over 100,000 tons are produced every year, 4,500 men working in the quarries and about 1,000 men sawing and polishing the marble. Italian copper is smelted both at home and at Swansea, England; the distribution of other minerals is shown in Fig. 120.

Thirty thousand persons are engaged in mining sulphur. The exports amount to nearly 500,000 tons a year, of which the United States purchases about one third. Sicily, the largest producer in the world (p. 138), mines most of it.

Manufactures are growing (Fig. 123). These industries, however, owing partly to lack of capital, coal, and continuous water power, are still inferior to those of the great industrial states. While there is an important foreign demand for a few articles, such as Venetian glass, Milan cutlery, straw goods, and coral jewelry, the imports of

manufactures are more valuable than the exports. The industries are mainly confined to the north. The leading branch is silk goods, centered largely in Lombardy (Milan and Como), Piedmont, and Venetia; Florence, Naples, and

Fig. 123.

Palermo are also represented. Woolen cloths are produced in increasing quantities, so that Italy is importing less than formerly. Imports of raw cotton increased thirteenfold between 1871 and 1898. Cotton from British India was formerly preferred, but, being adapted only for coarser fabrics, American and Egyptian cottons are now chiefly used. Exports of cotton cloth, mainly to Argentina, Brazil, and Turkey, now exceed the imports.*

* The hemp fields give abundant material for the large cordage manufactures. Until after 1888, Italy bought most of her iron and steel from England, Germany, and France; but large establishments in the towns around Genoa and elsewhere now produce a great deal of finished steel, and make locomotives, rails, and machinery. Shipyards

The imports are food supplies, fuel, raw materials, and manufactures; the exports are chiefly agricultural. Grain is the largest import, followed by raw cotton, wool and woolen manufactures, timber, iron, and steel. Raw silk and silk goods are about a third of the entire exports, while olive oil, wine, straw goods, hemp, fruits, eggs, coral manufactures, and sulphur are very important. Observe below the predominance in 1899 of imports from Great Britain (mainly coal, iron, textiles, and machinery); also the predominance of exports to the great silk-manufacturing countries of Europe. Among the articles that Italy sells to the United States are sulphur, olive oil, marble, and wine. Cotton, tobacco, wheat, copper, and farm machinery are among the large purchases from this country.

STATISTICS FOR ITALY

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS)

	1871–'75.	1881–'85.	1890–'94.	1901.	1903.	1908.
Imports.....	263.0	297.0	260.0	331.6	408.8	562.3
Exports.....	241.0	249.0	212.5	265.3	308.6	333.7

IMPORTS FROM LEADING COUNTRIES, 1908 (IN MILLION DOLLARS)

Great Britain.	Russia.	Germany.	United States.	Austria-Hungary.	France.	Switzerland.	Belgium.
100	25	104	81	60	55	16	15

EXPORTS TO LEADING COUNTRIES, 1908 (IN MILLION DOLLARS)

Switzerland.	Germany.	France.	Austria-Hungary.	Great Britain.	United States.	Belgium.	Russia.
59	49	41	29	26	41	7	2.4

Population (1908), 34,270,000.

The coinage, weights, and measures are those of France, the names being changed to Italian equivalents.

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at Sestri, near Genoa, Venice, and Spezia make men-of-war and merchant vessels. Metals and machinery are still imported in large quantities. Italy excels in various artistic products, such as the mosaics of Florence, Venice, and Rome, the glassware of Venice, made from the silica of neighboring Murano, and the porcelain and jewelry manufactured at Naples and other cities.

CHAPTER XXVIII

SPAIN AND PORTUGAL

The influence of the natural features of the Iberian Peninsula is to retard rather than to promote commerce. The peninsula, however, is more favorably situated for trade with Central and South America and West Africa than any other country of Europe. Though nearly surrounded by sea, the height of the plateau, which is surmounted by mountain ranges, gives most of it a continental instead of a sea climate. The mountains keep the larger part of the rainfall from reaching the interior, which is therefore very dry. On the Mediterranean coasts the rain falls mainly after the growing season; irrigation is therefore the basis of most of the agriculture. The mountains make road-building difficult; the rivers are too small and swift to be navigable except for short distances; the peninsula, therefore, has inadequate means of communication, which is to the detriment of all kinds of business. The Pyrenees are a wall of exclusion, for there are no passes across them like those of the Alps which lead from Austria, Switzerland, and France into Italy. Railroads pass around the ocean ends of the Pyrenees, but the detour is inconvenient, and most of the freight is carried by sea.

Spain's largest interests are agricultural (Fig. 124). Over half the people live by agriculture, which supplies more than half of the exports. The special disadvantages of the farmer are that most of the land is in large holdings owned by the nobility, farm methods and implements are primitive, taxes high, and communications poor. The special

advantage is that irrigation works, begun by the Moors, and extended and fostered by Government to the present time, are among the most extensive in the world. Irrigation, in a wide belt along most of the Mediterranean front,

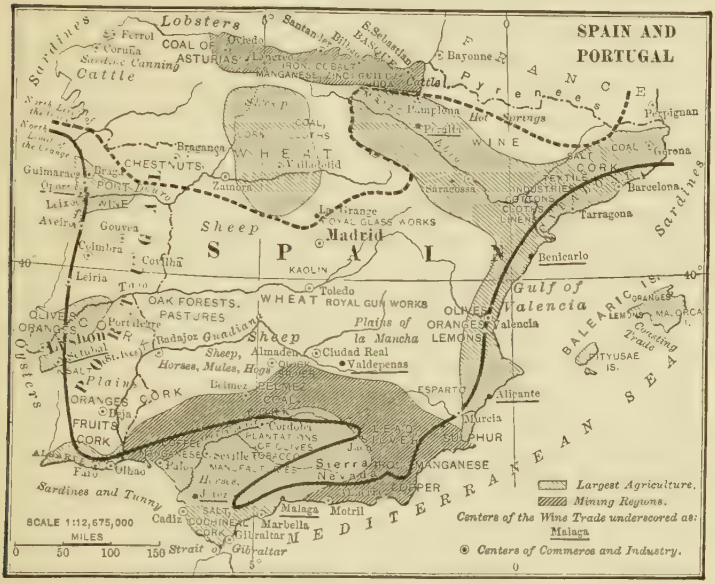

Fig. 124.

has helped to transform a large area into a region of remarkable fertility, well worthy of the name huertas or gardens. Rock is blasted and powdered to form soil, street sweepings and other fertilizers are used, and as a result no land in the world is more productive. These irrigated lands produce southern fruits, vegetables, sugar cane, maize, and other crops requiring abundant moisture.

The dry lands of the interior are of much greater extent. Depending almost wholly upon rainfall, a large part of them are untilled. However, wheat and other cereals grow on them. The wheat crop does not always meet the needs

of the local markets, and then imports are considerable. A wide region around Valladolid (Fig. 124) is called the granary of Castile; rice thrives on swampy lands bordering the Gulf of Valencia; barley is grown for cattle food, and rye is the staff of life in the moist northwest; oats are little grown.

Wine is the largest export. In 1891 it was nearly a third of the total exports. The grape thrives nearly everywhere; the tonic quality of some of the vintages has caused them to be highly valued for medicinal as well as for table use; many ordinary wines, poorly made and selling at a pittance, are consumed by the peasantry (p. 69). The wines of Jerez (sherry), of Malaga, and Alicante (Fig. 124) are particularly renowned. England and the United States take a large part of the exports.

Fruits are a large export. They are the most profitable crop of the huertas. Oranges and lemons are a great product along the Gulf of Valencia and in the Balearic Islands. The peel of the bigarade, the bitter orange, is sent to Holland for the manufacture of curaçao.* Olives and olive oil are only less important than oranges in foreign trade. Spain produces more olive oil than any other country, and consumes most of the product. The olive is grown nearly everywhere, but mainly in the southern provinces. Spanish olives for table use come largely from Seville. Most of the oil is supplied from Cordoba; a great deal is refined in France, much of the home product being poorly made. Esparto, an important export to England, grows on the dry lands of the southeast (p. 103). Tobacco, a Government monopoly, is imported, though it is also raised in the country.

Animal industries are less important. No animal products figure to a very large extent in foreign sales; on the

* The common form curaçoa is due to a blunder in spelling the name of the island Curaçao on an early map. The spelling curaçao for the liqueur is fully authorized, and is used by some of the Schiedam manufacturers.

other hand, woolen and silk goods, codfish, and live animals are large imports. The climate is so dry that few pastoral areas have a luxuriant growth of grass. Only in the northwest, where rain from the Atlantic is abundant, are cattle raised in large numbers, some being sent to British markets. The animals used in the cruel national sport of bullfighting are reared in the southern mountains. Fine horses, originally of Arab stock, are also raised in the south; but, as in all Mediterranean countries, mules and donkeys are more numerous. In proportion to population, Spain raises more sheep than any other country of Europe; they graze on the drier pastures of the plateau. The famous fine wool merinos that did so much to improve the wool crop of the world have been largely replaced by coarse wool breeds. The wool product does not suffice for home needs. Hogs are most numerous in the oak forests of the west (Fig. 124). The climate is highly suitable for silkworm culture, but the industry is now only one tenth as large as a half century ago. Raw-silk culture is mainly confined to the regions along the Gulf of Valencia. Five sixths of the silk is sold in France, from whence large quantities of silk goods are imported. The fisheries are important, but do not begin to supply the demand.

Cork is a large export (Fig. 124). It is derived from the bark of a species of oak thriving mainly in Spain, Portugal, and Algeria. The bark is used as stoppers for glass bottles, in life-preservers and lifeboats, and with linseed oil to make linoleum (p. 114). As most of the country is treeless, the wood imports from Scandinavia, and of staves for wine casks, from the United States, are large.

The mineral resources in the mountains of the north and south are very great. Foreign capital carries on most of the mining, which has not as yet produced great industrial development (Fig. 124). The southern mountains are among the largest producers of copper and quicksilver in the world (Fig. 67 and p. 138); they yield also great quan-

tities of silver and lead. The superior iron ore of the north coast is sent from Bay of Biscay ports by thousands of tons to Great Britain, Germany, France, and Belgium; but Spain does not figure very largely in pig iron and steel manufactures. Although the northern and southern mountains contain vast quantities of coal, the commodity is imported for home industries. The main use of metals is to sell them to foreign countries; the shipments are therefore very important.

Manufactures do not supply the demand. The purchasing power of the masses of the people is very small; it is therefore cheaper to import goods than to establish expensive plants to supply the home need. The largest center of manufactures is Barcelona and the surrounding region, where the textile industries have important development. Large quantities of Spanish cottons and linens were sold in the colonies of Spain before she lost them. The manufacture of iron and machinery is important in the iron districts of the north coast. Flour and oil mills are numerous. One company has a concession from the Government to manufacture and sell all the tobacco; 50,000 families are supported on the wages it disburses. The factories depend, to a large extent, upon American tobacco. Silver and gold manufactures, glass, china ware, and chocolate are specialties of Madrid and a few other cities.

Spain is poor in railroads. Freight rates are high, trains are slow, and the most productive regions are still destitute of rapid and cheap communications with the ports and interior cities (p. 45). Spain takes so small a part in international trade that the merchant marine is inferior, the shipping being almost all under the British or French flags.*

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* The most important port and most active industrial and commercial city is Barcelona. The coal fields north of it supply the local industries and shipping. Valencia, on the gulf of that name, exports

The value of the exports is nearly equal to that of the imports. The exports of wine, minerals, and fruits are very large. Imports are confined mainly to articles of necessity, such as cotton, coal, food, textiles, lumber, and machinery. One third of the foreign trade is with France, Great Britain being the next largest buyer and seller. Spain's foreign trade is only half that of Belgium and a third that of the Netherlands.

Portugal's foreign trade is only one fourth as large as that of Spain. The soil is poor, about one half of the area being unproductive. The largest industries are agriculture and fisheries. The development of textile industries at Lisbon and Oporto for the home and colonial trade is somewhat important. Wine is the great export staple, comprising more than a third of the foreign sales. The best known wine is port, which is manufactured and shipped at Oporto. Cork, copper, fish, and southern fruits are also important shipments. Colonial goods* are the largest imports except grain.

STATISTICS FOR SPAIN

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS)

	1881–'85.	1890–'94.	1901.	1902.	1908.
Imports.....	156.0	175.0	161.9	175.4	167.8
Exports.....	138.8	160.4	129.4	161.3	153.2

Population (1908), 19,713,000.

The unit of coinage is the peseta, equal in value to the franc. Metric system of weights and measures.

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fruits, and has silk industries in connection with the adjacent supply of raw silk. Malaga exports the famous Malaga grape and wines, and zinc and lead ores. Cadiz depends upon commerce, but its trade is declining. Santander and Bilbao, on the north coast, ship iron ore from the neighboring mines. Madrid has more political than industrial or commercial importance.

* In many commercial statistics the imports from European colonies in the tropics, such as sugar, spices, rice, and coffee, are grouped under the head colonial goods.

STATISTICS FOR PORTUGAL

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS)

	1881–'85.	1891–'95.	1901.	1903.	1907.
Imports.....	40.2	44.3	62.5	66.7	66.3
Exports.....	25.5	38.1	30.5	34.7	32.8

Population (1908), 5,423,000.

Gold standard; unit of coinage is the milreis, worth $1.08. Metric system of weights and measures.

Spain's trade with the United States in 1908 was: Imports, $23,686,000; exports, $7,022,000. Portugal's trade in 1908 was: Imports, $6,549,000; exports, $595,000.

NOTES AND QUESTIONS

In comparison with many other nations the Spaniards have very small capital. What is the effect of paucity of capital upon industrial development?

Can you explain why Spain's exports and imports in 1902 were $71,000,000 larger than in 1899?

Spain's foreign trade in 1902 was almost the same in value as that of 1890. Do you think the loss of her colonies is partly responsible for this lack of commercial growth?

But Spain is awakening. She is improving her inland communications, increasing the number of her schools, and training her workingmen. Her agriculture and other industries are growing and with them her commerce.

CHAPTER XXIX

RUSSIA IN EUROPE

The Russian empire embraces over one sixth of the land surface of the earth. It is nearly three times as large as the United States, exclusive of Alaska. Russia in Europe includes more than one half the area of Europe, and its population is nearly equal to that of the United Kingdom, Germany, and Spain together.

Extending farther south than the northern plains of Italy and penetrating the arctic zone, Russia has much variety of climate. Vineyards thrive in the Crimea, and frozen swamps skirt the north coast (Fig. 125). The winters are colder and the summers hotter than in western Europe in the same latitudes. No mountain ranges obstruct the cold north winds which sweep southward to the Black Sea. The only mountains are on or near the south and east borders of Russia, the Caucasus range with its continuation, the Jaila Mountains, in the Crimea, and the Ural Mountains, the longest range in Europe. The whole of Russia between these border mountains and the Baltic and Arctic Seas is a low plain, 300 to 600 feet above sea level, but rising in a few areas to 1,000 feet. One of these higher areas, of which the Valdai Hills are a part, is the center from which radiate most of the largest rivers, the Volga, Dnieper, Don, Western Dvina, and Niemen.

Russia is thinly populated. This is due to its far northern position and the predominance of agriculture over manufactures. Only one eighth of the people live in the

towns, but the growth of industries is increasing the urban population. Two thirds live in Poland, the Moscow industrial district, and the black-earth lands (Fig. 127), where the

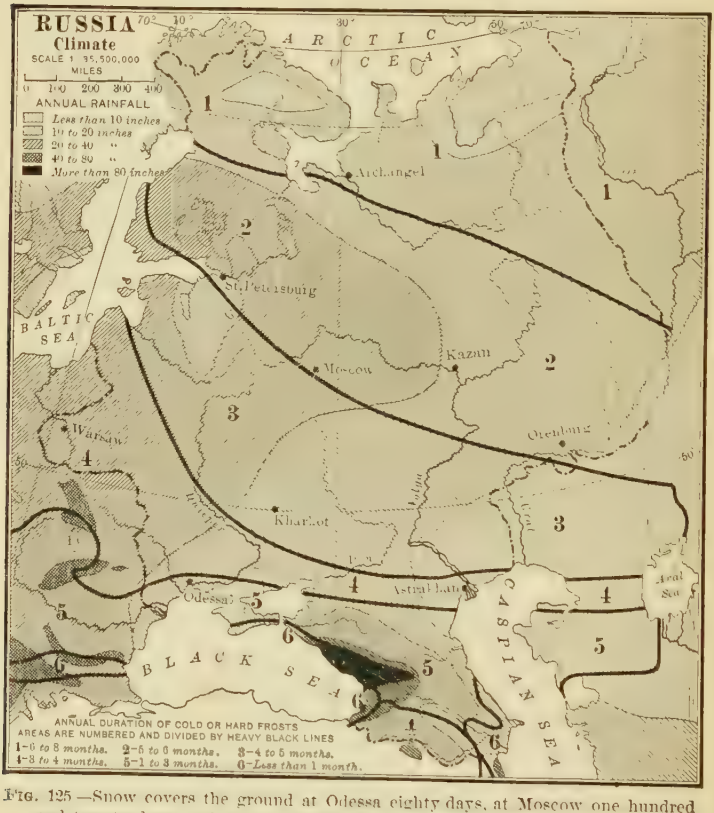

FIG. 125.—Snow covers the ground at Odessa eighty days, at Moscow one hundred and twenty days, and on the Siberian border near the Arctic Ocean over two hundred and twenty days. The average rainfall is not over 20 inches a year, which, though far less than in western Europe, is usually sufficient to insure good crops. Very dry seasons result in crop failure and famine.

demand for labor encourages the greatest density of population. There are many racial elements speaking many languages, Poles, Finns, Turco-Tartars, and Jews, but most of

the people are Russians. The peasantry are inferior in education and enterprise to those in countries west of them.

The Government strives to develop manufacturing and make Russia industrially independent. It protects home industries by a high tariff, averaging 35 per cent of the value of imports, charging the Ministry of Manufactures and Trades with the supervision of industry and commerce, supports ninety agricultural schools and many experimental farms, and appoints special agents to seek foreign markets for Russian products. The duty on coal at Black Sea ports is four times that at Baltic ports, because coal sent to the Black Sea competes with south Russian coal, which in north Russia is dearer on account of freightage.

Agriculture is the leading industry (Fig. 126). Yet, owing to the poverty and ignorance of most of the peasantry, inferior farm machinery, frosts, and severe periods of drought,

Fig. 126.—Subdivisions of the soil in Russia.

agriculture is not highly developed. English farmers raise from two to four times as much grain to the acre as Russian farmers. Still, Russia produces about two thirds of the oats and half the rye of Europe, more barley than any other European state, is surpassed only by the United States in its wheat crop, and raises more flax and hemp than any other country in the world (Fig. 127). Maize is grown in the southwest. In good seasons Russia exports 95,000,000 bushels of wheat, ranking after the United States as a seller of this cereal, supplying three fourths of the export wheat of Europe, and selling most of it in west and south Europe. Rye is the leading breadstuff for home consumption, and the quantity raised is more than double that of wheat. Oats, barley, and rye are largely raised north of the chief wheat area. Rice, raised in Trans-Caucasia, is shipped all over Russia, through Volga and Black Sea ports. Flax has

the largest acreage of any crop, and supplies nearly four fifths of the flax fiber in the world. Hemp has a much smaller acreage.

More than 1,000,000 acres are given to sugar-beet culture. The home product supplies a surplus for export, Russia being the chief source of sugar for all the Black Sea territory and Persia.*

Russia has the third place in the extent of its forest area (p. 114). The home demand for lumber and fuel is enormous, as most buildings are of wood and as wood fuel is largely used in manufactures and in the reduction of ores. The lumber industry is active near streams, that float logs to the mills and the product to market, and flourishes far north in the Northern Dvina basin and east of it. Lumber and timber exports, worth about $25,000,000 a year, are surpassed in value only by the wheat shipments. Other products of the forests are resin, tar, potash, turpentine, and wood pulp; the forests, too, are the source of the most of Russia's diminishing fur trade.

More farm animals are raised than in any other country of Europe (Fig. 127). Stock raising, which is not so prominent in the black-earth lands, flourishes in the southern steppe regions, where there are enormous herds of cattle, horses, sheep, and, in the southeast, camels. About half the horses of the continent are raised in Russia; it far surpasses all the other countries in cattle and sheep, and is inferior only to Germany in the number of hogs. Large quantities of hides, leather, hair, and bristles are exported. Meat and milk are the main object of cattle raising in the United States and western Europe, but in Russia dairy

* Russia ranks after Germany and Austria-Hungary in tobacco culture, producing about 100,000 tons a year. The potato crop is large, and is used both as food and in the distillation of brandy. Viticulture has made much progress in the southwest, and the best red wines now compare favorably with good French wines and are cheaper. The first exports went to Great Britain in 1897.

FIG. 127.—The vegetation may be divided into five areas: (1) The tundra (treeless land), on the arctic coast, growing reindeer moss, lichens, and stunted shrubs; (2) the forest, south of the tundra, covering more than a third of the country, extending over the whole north and part of the central regions; (3) the farm lands, where most of the root, grain, and fiber crops are grown, stretching in a wide zone south of the forests. (This agricultural zone or black-earth region, covered to various depths with a dark, rich, vegetable humus, is Russia's greatest source of wealth, as it is the great wheat-growing region.) (4) The fertile steppes of the southwest and south, where millions of cattle, sheep, and horses graze; (5) the sterile or salt steppes of the southeast, unfertile on account of very small precipitation, inhabited only by nomads.

products are of secondary importance, hides and tallow being the chief interest.*

Minerals are very abundant (Fig. 128). About 95 per cent of the world's supply of platinum comes from the west side of the Urals (p. 136). Most minerals, including metals, are consumed in the home industries, the exports being partly raw materials and partly manufactured articles. Russia supplies four fifths of all the coal and pig iron used in the country, and nearly all the steel. The best coal, anthracite, is obtained in south Russia, near the Donetz River, and these mines and those in Poland yield two thirds of the output. Iron ore is mined most largely in the Urals and south Russia. The production of iron is restricted by the inadequate supply of coal, and the fact that most of the wood (charcoal) within easy reach of the smelters has been consumed. For this reason Russia has to import much iron and its manufactures. The metal and machinery industries are thus embarrassed. The only regions where coal and iron in juxtaposition are largely mined are south Russia and Poland. The iron product of the Urals and south Russia is about equal, and iron is mined in the Kama basin and the lake region of Finland, where the ore is of good quality and cheaply produced. †

In 1887–'97 Russia tripled her production of iron and steel. Their inferior quality, due to primitive methods, is being remedied by improved processes. Most of the smelters are in the Urals and near the southern coal and iron districts, and the metal is worked chiefly in South Russia,

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* In few other countries are fish so important, the demand being largely augmented by numerous fast days. The whale and cod fisheries along the Murman coast are now being developed (Fig. 127).

† The Urals yield gold, silver, and copper. Mercury is produced in Ekaterinoslav, and zinc is a product of Poland. The rich beds of rock salt in the Donetz basin yield a fourth of the total supply, the Crimea being also a large producer, and an important quantity being obtained from salt wells and saline lakes.

FIG. 128.—The rivers, navigable almost to their sources and easily connected by canals, provide continuous highways from the Baltic to the Caspian Seas. They carry enormous commerce, and are the chief and cheapest means of communication. The Russian rivers have natural disadvantages: they are closed by ice in the long winters; all except the arctic tributaries terminate in inland seas; deficient rainfall impedes navigation in some southern rivers, most notably the Don; the great value of the Dnieper, Bug, and Dniester as commercial highways is impaired, though not destroyed, by rapids where these streams cross the narrow granite belt of southwest Russia.

Moscow, and the St. Petersburg district (Fig. 127). The railroads are supplied with home-made rails.

Machinery manufactures are in the central and particularly the southern industrial regions and St. Petersburg. About 200 factories supply agricultural machines and implements. As the product is not equal in quality to imported goods and as the supply is not equal to the demand, the heavy duty on most agricultural machinery has been removed till 1903 to encourage imports.

Russia has become nearly independent of foreign manufactures (Fig. 127). Within forty years large industries have been developed by means of modern machinery and the factory system. The majority of workers, however, still toil in their village homes, as their fathers did, making many products in the long winters: fabrics of linen, wool, cotton, and silk, leather, wood and metal work, cutlery, agricultural implements, pottery, etc. Combining their small capital, many are buying machinery and increasing their output. There are more than 100,000 of these small factories and workshops, and about 24,000 factories are situated in the large centers of population. About 2,300,000 people are employed in the village and large factories. Industries that do not supply the home demand are chiefly paper manufactures, glass, china ware, and chemical products. Moscow is the greatest industrial center, for, being the railroad center of Russia, with forests on the north and coal on the south, it is most conveniently placed for receiving raw material and distributing products.*

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* Warsaw is, next to Moscow, the most important inland city (Fig. 128). At the center of steam navigation on the Vistula, it is the third largest city of the empire, the point of convergence of trade routes between Russia and western Europe. Lodz (Fig. 127), near the Polish coal fields, produces seven eighths of all the cotton cloth made in Poland and one-tenth of the cotton yarn spun in Russia. One of its streets, six miles long, is lined with many factories. Vilna, on the railroad between St. Petersburg and Warsaw, is an industrial town; Kief is the

The chief centers of the textile industries (cotton, silk, woolen, and linen goods) are the Moscow industrial region, St. Petersburg, and the neighborhood of the central and Polish coal fields. Russia produces fine qualities of prints, silks, velvets, and woolen goods.

Cotton manufacturing has excluded all except the finer foreign fabrics, and is increasing the export of home fabrics to Asia, but can not compete in the markets of central and west Europe. Russia occupies the third place in cotton spinning, after Great Britain and the United States. One third of the raw cotton comes from Russian territory and two thirds from the United States. The cotton goods are worth two thirds of the total value of textiles, and give employment to nearly 1,000,000 adults and children.

The Moscow district leads in wool spinning and weaving, and St. Petersburg, Tver, Lodz, Warsaw, and Kharkof are the other centers. The silk industry, concentrated almost wholly in the Moscow district, consumes over $6,000,000 worth of raw silk and yarn a year, bought in Italy, China, and Persia. Linen manufacture is largely carried on in the central governments, Vladimir, Kostroma, and Jaroslav being the chief centers.*

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largest center of sugar refining: Kharkof does $20,000,000 of business at the annual January fair: Saratof is one of the tobacco growing and manufacturing centers: Kazan is occupied with tanning, distilling, and the manufacture of "Russia leather," linen, and candles; Tula, famous for cutlery and samovars, is the seat of the Government small-arms factory; Orenburg is a caravan terminus; Tver is the head of steam navigation on the Volga: Poltava is noted for its wool and horse fair; Smolensk is a large commercial center; Perm has large gun works; and Rybinsk is the center of grain forwarding by water to St. Petersburg.

* The distillery industry is very large, the average consumption of spirits being about two gallons per capita a year. Esthonia, south of the Gulf of Finland, is the greatest center of production. The larger shipbuilding yards are at Sebastopol, Odessa, and Nicolaeff. Flour mills are most numerous in the black-earth region and the southern

The great fairs of Russia are a feature of its internal commerce. The most famous of these is held in August at Nizhni-Novgorod. The several hundred thousand persons from European and Asiatic Russia who attend do an annual business of $35,000,000. All kinds of Russian merchandise, iron manufactures from Siberia, cotton from central Asia, silks and silverware from Persia, Bokhara, and Tashkent, and turquoises from Persia are sold. Large fairs are also held at Kharkof, Poltava, and Kief; but the importance of these great markets is declining, because cheap travel makes it easy for merchants to buy in the towns where goods are made and kept in large stock. Cheap freight rates both by land and water prevail.

The rivers and canals are of larger importance than railroads in internal commerce (Fig. 128). There are 46,000 miles of navigation, more than half of it floating steamboats; 67 per cent of river freight is carried on the Volga and Neva systems. Short and cheaply constructed canals between the rivers greatly extend navigation.*

Hundreds of freight boats from the Volga and Northern Dvina reach St. Petersburg every year. As the cart roads are very poor, the winter season, when sledging is universal, is best for land haulage.

Three fifths of the railroad mileage is operated by the Government (Fig. 129). Trunk lines connect the extremi-

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ports. Russia is unsurpassed in the excellence of her leather products, but does not now monopolize the manufacture of "Russia leather." There are 400 sugar refineries in the Kief and Kharkof governments and Poland. Soap and candles are important manufactures.

* The longest river and canal routes are:

1. Caspian Sea and Arctic Ocean: (*a*) Volga-Kama and Vichegda-Northern Dvina; (*b*) Volga-Sheksna and Sukona-Northern Dvina.

2. Caspian Sea and Baltic: (*a*) Volga-Sheksna-Belo Ozero and Svir-Ladoga-Neva; (*b*) Volga-Mologa and Ladoga-Neva; (*c*) Volga and Msta-Ladoga-Neva.

3. Black Sea and Baltic: (*a*) Dnieper-Beresina and Western Dvina; (*b*) Dnieper-Pripet and Vistula; (*c*) Dnieper-Pripet and Niemen.

ties of the empire, or are being built. Foreign trade by land is thus carried on with central and west Europe and the Asiatic countries to the east and southeast.

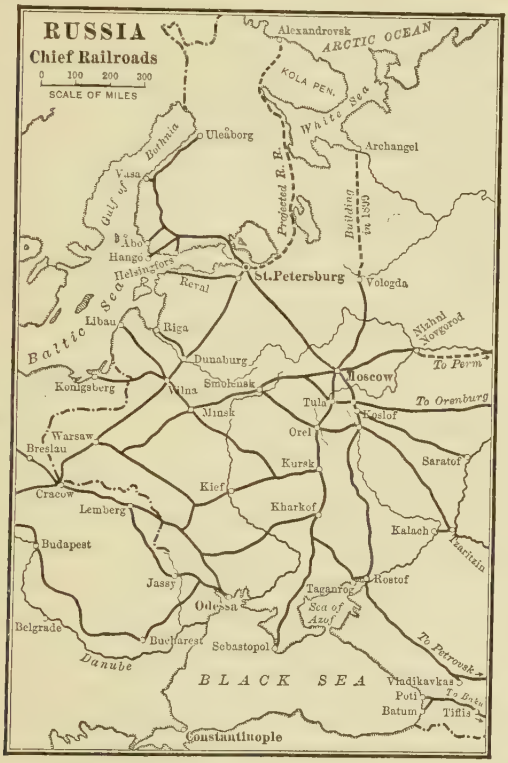

FIG. 129.

The exports amount to over one million dollars a day and the imports to about three fourths or more of that amount. Over one half of the exports are cereals and flour. Other leading articles in the order of their importance are flax and hemp fibers, timber, and wooden goods, oil grains (linseed and grass seeds), dairy produce and eggs, naphtha,

and sugar. Manufactured goods are mostly consumed in the country or sent to Asiatic Russia, Persia, Anatolia, and China. The leading imports are materials for manufacture, cotton, raw metals, wool and woolen yarn, leather, hides and skins, chemicals, dyestuffs, and coal, besides machinery, tea, wine and spirits, and textiles of the finer grades. The largest business is done with Germany and the United Kingdom, Germany supplying a third and the United Kingdom a fifth of all Russia buys in other lands, and Germany purchasing a quarter of what Russia sells abroad. Great Britain is by far the largest purchaser of cereals, and Russia depends upon that country and Switzerland for cotton-manufacturing machinery. The imports of machinery from the United States are important; the exports to the United States are very small, chiefly manganese ore and licorice root.

The chief seaports are on the Baltic and Black Seas (Fig. 128). Russia, however, does not control the channels connecting them with the Atlantic. They are blocked by ice, except Odessa, Sebastopol, and Hangö, from two to five months, but ice-breakers are now lessening this obstruction. The Black Sea ports are the main outlets for agricultural produce. The sea trade with south Europe and Asia is chiefly through Black Sea ports; with north and central Europe and the United States through the Baltic ports.*

* Odessa is the main outlet for the agricultural products of southwest and south-central Russia. Flour mills, sugar refineries, breweries, and machine factories give the city large industrial importance. Other Black Sea ports are Nicolaeff, chief station of naval construction, a point of grain shipment and of petroleum distribution inland; Kherson, with exports of cereals, timber, and hides; Sebastopol, now a naval station closed to trade; Berdiansk and Mariupol, grain ports of the Sea of Azof; Taganrog, exporting grain, and connected by rail with the Donetz coal fields; and Rostof, exporting grain, wool, and cloth, with large fisheries interests and manufactures of farm machinery.

St. Petersburg, though remote from the largest mining and agricultural regions, is a great trade center. The exports are valued at only

FISHING ON THE URAL RIVER.

STATISTICS FOR RUSSIA

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS)

	1881–'85.	1891–'95.	1901.	1907.
Imports	275.0	234.5	305.6	436.4
Exports	290.0	314.0	392.2	542.3

IMPORTS FROM LEADING COUNTRIES, 1908 (IN MILLION DOLLARS)

Germany.	England.	United States.	Austria.	France.	Belgium.	China.	Holland.	Italy.
160.0	60.5	37.0	1.25	17.5	4.0	7.3	5.7	6.3

EXPORTS TO LEADING COUNTRIES, 1908 (IN MILLION DOLLARS)

Germany.	England.	France.	Holland.	Italy.	Austria.	Belgium.	Turkey.	United States.
139.3	110.0	32.1	46.5	14.9	24.4	17.1	10.6	1.2

The trade with the United States in 1905 was: Imports, $16,686,330; exports, $11,653,954.

The unit of coinage is the silver rouble, worth nominally 77 cents; average value, about 50 cents. The unit of measurement is the arshine (28 inches); that of weight is the pood (36 pounds avoirdupois), divided into 40 pounds.

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one third to one half as much as those from Odessa, but the imports are about twice as much. The imports, chiefly food, raw materials, and articles of luxury, are mostly consumed locally. Grain and timber are the largest exports. At Riga oats, rye, and lumber head the exports, and coal is imported from England for its textile and machinery industries. Reval leads all the ports in the shipment of spirituous liquors. It is free from ice five weeks longer than other Baltic ports. Helsingfors is the center of the Finnish import trade. Viborg exports lumber and Åbo has shipbuilding works. Hangö (Fig. 129), ice free, is important in the winter trade between St. Petersburg and Stockholm. Archangel, on the White Sea, is closed by ice nearly seven months. It exports hemp, flax, oats, and the forest products to northwest Europe and the United States. Astrakhan is the shipping port on the Caspian for the Persian trade. Its chief industries are sturgeon and other fishing, and caviare manufacture.

CHAPTER XXX

THE BALKAN PENINSULA AND ASIATIC TURKEY

Important trade routes between the Occident and the Orient pass through the Balkan peninsula (Fig. 130). In this respect it resembles Italy and contrasts strongly with Spain (pp. 288, 298). Railroads from Constantinople near the Black Sea, from Varna and Burgas on the Black Sea, and from Salonica and Dedeagatsch on the Ægean Sea connect with all the commercial centers of the west; thus the peninsula is a bridge between Asia and western Europe. It is a very mountainous land, sloping to plains and lowlands in the eastern half, so that it has been said to look toward the east. The northern part has the continental climate; subtropical conditions prevail on the southern coasts. The great diversity of peoples and creeds, resulting in religious and political strife, kept most of the peninsula, till recently, outside the field of international trade. Agriculture is almost the sole occupation.

The Danube affords, with the Rhine, Main, and Ludwig canal, an unbroken water way between the North and Black Seas. A commission appointed by the powers, whose duty is to prevent violation of the Danube's neutrality and to keep the river navigable, has absolute control of the lower Danube. Sulina is the Black Sea port at the mouth of the middle branch, the only outlet in the delta which large vessels can enter. The river is usually closed by ice in January and February.

Rumania is one of the three large granaries of Europe. Lying between the Carpathians and the Danube, the king-

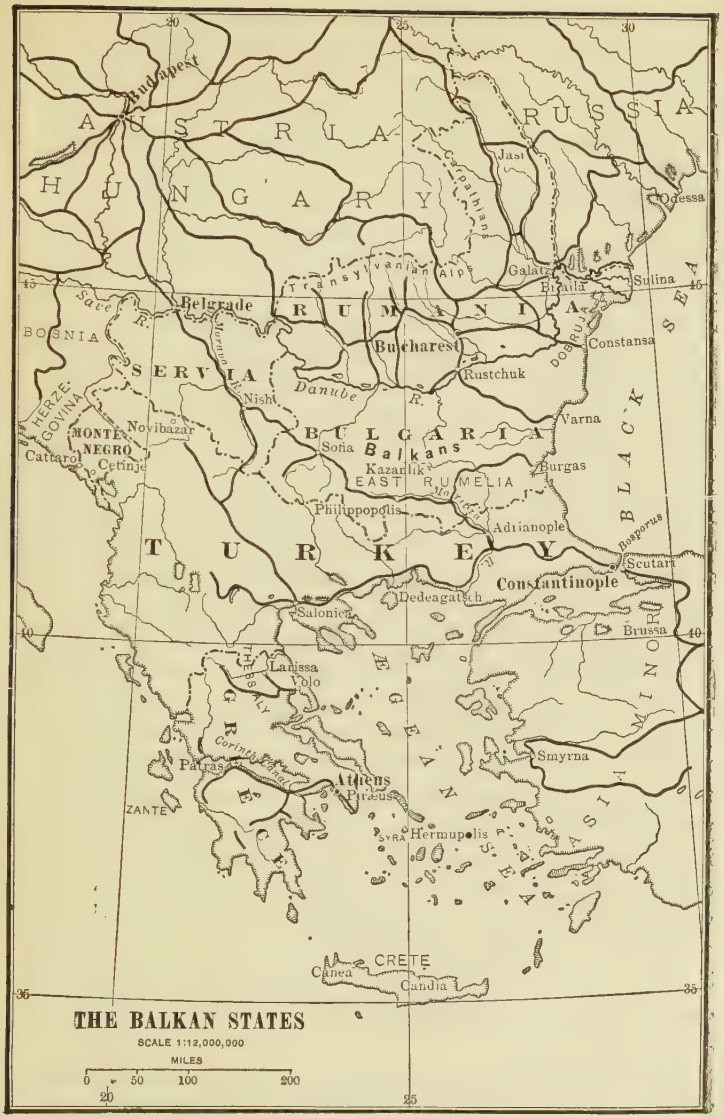
Budapest
AUSTRIA
HUNGARY
RUSSIA
Jassy
Odessa
Galatz
Braila
Sulina
Transylvanian Alps
Save R.
Belgrade
RUMANIA
BOSNIA
Bucharest
Constansa
SERVIA
Rustchuk
Danube R.
Nishi
HERZEGOVINA
MONTE NEGRO
Novibazar
Cattaro
Cetinje
BULGARIA
Varna
Soña
Balkans
Kazanlik
EAST RUMELIA
Burgas
Philippopolis
Adrianople
TURKEY
Bosporus
Scutari
Constantinople
Dedeagatsch
Salonica
Brussa
Larissa
Volo
Smyrna
Patras
Athens
Piræus
ZANTE
SYRA
Hermupolis
CRETE
Canea
Candia
BLACK SEA
ASIA MINOR
THE BALKAN STATES
SCALE 1:12,000,000
MILES
0 50 100 200

FIG. 130.

dom is mostly plain, with a warm, rich soil, the western extension of the black-earth region of Russia (Fig. 127). The inhabitants are mainly farmers, but agriculture is still backward, for the peasantry were serfs till 1866, and have made progress slowly. Cereals are the great product of the plain, maize being the largest crop, as in the United States, followed by wheat, which is now prepared for market by steam threshing machines. Most of the wheat may be exported, as maize is the staple food. Grain is three fourths of the exports, most of it being shipped to Great Britain, Belgium, and Germany by water from Galatz, the Danube port above the delta for ocean vessels. The vine is grown along the sunny foothills of the Carpathians; stock raising is large, but animals have not yet become very important in foreign trade. Rock salt, largely exported, and petroleum from the Carpathians are the only mineral products. Bucharest, in the center of the plain, is the chief trading point; Galatz, on the Danube, is the great grain port; Constansa (Kustenji) ships cattle from the Dobruja plateau. Attempts to establish large industries have failed owing to lack of coal, capital, and skilled labor; but flour mills, distilleries (producing whisky from maize and brandy from plums), saw mills, shoe and clothing factories, and tobacco manufactures (a state monopoly) are considerable industries. Home weaving and other household industries supply the primitive wants of the people. All fine articles are imported, the imports, mainly textiles, metal wares, and colonial goods, coming most largely from Austria-Hungary, Germany, and Great Britain; few of these imports are from the United States. There is small trade with neighboring Russia, for neither state has much to sell that the other needs.*

* The effect of the poor crop years of 1897–'98 upon Rumania's trade in 1899 (p. 326) illustrates the vicissitudes to which the commerce of a purely agricultural country is exposed.

Swine and hog products are the chief exports of Servia. Hogs feed in every valley on acorns and beech nuts, oak and beech trees covering most of this mountainous kingdom. The river valleys are very fertile, and large crops of maize and wheat are raised. The ravages of phylloxera reduced the wine crop till wine is now an import. Belgrade, the capital, splendidly situated at the confluence of the Danube and the Save, is the chief trading point between Vienna and Budapest on one side and Constantinople and Salonica on the other. Here most of the business of the country is done, and the few important industries, carpet, cotton, and silk weaving, are carried on. The international railroad passes through Belgrade, follows the fertile valley of the Morava River, and branches at the little city of Nish, one line going southeast to Sofia and Constantinople and the other south to Salonica; the transit freight trade is therefore important. Most of the manufactures, spinning and weaving, are carried on in the homes. As Servia has ample water and rail communications with Austria-Hungary, its commerce is largely controlled by that empire, which buys five sixths of the hogs, cattle, and other agricultural products and supplies five eighths of the metals, textiles, and other imported manufactures. Great Britain and Germany have the larger part of the remaining trade.*

The southern half of Bulgaria is its most fertile and prosperous part. Rich plains abound there, while the northern half is more mountainous. In the center is the famous Valley of Roses, whence the world derives a part of its most delicate perfumery, more than half of the attar of roses coming from this valley.†

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* Considerable of the Balkan trade, credited to Austria-Hungary in statistical tables, merely passes in transit through that empire to or from Germany.

† Attar of roses is the oil distilled from the petals of the damask rose, 1,000 pounds of leaves making a pound of oil. The rose flourishes in the sandy soil around Kazanlik, which is the center of the

Cereals, most of all wheat and maize, occupy two thirds of the tilled lands; large areas are given to tobacco, fruit, and wine. The people have the taste and talent for manufactures, but their wretched condition, when under the Turkish régime, prevented large development. They surpass the Servians in manufactures, their leather and shoe goods, woolen textiles, and carpets being noteworthy. Most of them, however, are coarse, and they are consumed solely in the home trade.

Sofia, the capital, joined by rail to western Europe and Constantinople, has a large trade; Rustchuk is the Danube port, with a railroad to Varna, the Black Sea port of north Bulgaria; Burgas, the port of south Bulgaria, is joined by rail to the international railroad, which follows the rich valley of the Maritza across Bulgaria. All the chief towns have increased in population from four to tenfold since Bulgaria, which includes Eastern Rumelia, became autonomous in 1878. Its former deplorable state illustrates the paralyzing effects of despotic rule upon industry and commerce. Grain, textiles, live cattle, hides, and perfumeries, the leading exports, are sent chiefly to England, Turkey, Germany, France, and Belgium. The imports, mainly textiles and yarn, colonial goods, metals, and metal wares, come chiefly from the same countries.*

The principality of Montenegro has no railroads or industries and little agriculture. This mountainous, limestone region, a part of the Karst (Fig. 114), affords poor pasturage and only small areas of arable land. Stock raising and fishing are the chief pursuits. Nearly everything except food is imported; animals and their products are the sole

industry. About $500,000 worth of oil is exported every year in addition to supplies from Persia, Turkey, and other eastern countries. The oil being very expensive is likely to be adulterated. Rose water is water tinctured with attar of roses by distillation.

* Observe the effect upon Bulgarian trade in 1899 of two successive poor harvests (p. 327).

exports. The very small trade is with Austria-Hungary and Great Britain. Cetinje, the capital, is connected with the Austro-Hungarian port of Cattaro by a good road.

Greece has neither coal, wood, water power, nor capital to encourage the development of large enterprises. The country has many deep gulfs, providing excellent harbors. The Greeks are naturally, therefore, a seafaring people, carrying a large part of the trade of the eastern Mediterranean. In their mountainous country they enjoy a genial climate, but rain falls chiefly in winter, which prevents large agriculture. There are other influences that tend to keep the country poor; it is so sparsely populated that workmen are hard to obtain, many foreigners finding employment in mining and railroad construction. There are almost no roads except mule tracks; the few railroads do not supply adequate transportation. Traffic is therefore mainly by vessels along the coasts. The Corinth Canal (Fig. 26) is a great convenience to home and foreign shipping. Grain, currants, the vine, and olives are the staples of agriculture, which is the chief resource, though only one sixth of the land is cultivated. The valleys and islands have small farms planted with vegetables, vines, and orange, lemon, and olive trees. The wide northern plains of Thessaly and other plains and valleys produce fine crops of grain. The soil is excellent, but water is the problem of tillage. It is often found near the surface, and is supplied to the crops from wells worked by crude machinery; all the fruit crops are irrigated. The supply of grain is so inadequate that two thirds of the wheat consumed is imported from Russia, Rumania, and Turkey. As most of the animals are sheep and goats, butter is a large import. Most of the raw silk produced in the south is exported to France for manufacture.

Mills in Piræus and Athens make cotton cloth; coopers supply wine casks; ships are built on the little island of Syra. Machine shops at Piræus build engines that are run by British coal; soap making is important; women in their

homes weave cloth and carpets; thousands of men make metal and leather goods in their small shops. These house industries are well developed and supply the poorer classes with most of their needs.*

As the kingdom does not produce sufficient grain, timber, cloth, yarn, metals, and general manufactures, these articles, together with coal and colonial goods, are the largest imports. Currants, wine, olives, tobacco, and fruits are the only agricultural products of importance in the export trade, currants† being about half the total exports of Greece. Lead and zinc ores and sponges are other important sales abroad.

Bad government in European Turkey has helped to cover its fertile plains with more weeds than grain or grass. This is the only non-Christian country in Europe. Many millions of Christians, however, live in Turkey. The Mohammedans comprise scarcely one half of the population.‡ Foreigners in Turkey live under the laws of their respective countries, which are administered by the consuls (p. 30).

The soil is fertile, but agriculture, though the mainstay of the people, is in a most backward condition. The op-

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* Athens, the political and intellectual capital, is also, with its port and suburb Piræus, the industrial and commercial center of the kingdom. Piræus is the most important port. Patras is the port for currant shipments. Hermupolis on Syra Island, in the middle of the Ægean, is a coaling station and large trading point.

† The currant is a small, seedless grape, cultivated and dried in southwestern Greece and some of the islands, principally Zante, and used in cakes and puddings.

‡ The Turks never assimilated the peoples whom they conquered. Millions of Slavs and Greeks in Turkey have never adopted Islam nor learned the Turkish language. The failure of the Turks to identify the conquered races with them is the chief cause of the disintegration of their European empire. In the nineteenth century Turkey lost Greece, Servia, Rumania, and Montenegro; it still has nominal suzerainty over Bulgaria, Bosnia, Herzegovina, and Crete, without any power, however, to interfere in their government.

pression of the Christians, ruinous taxation, and lack of roads have stifled energy.

Turkey is a leading market for foreign foods and manufactures. One third of the imports are foodstuffs and articles of luxury. Turkey once commanded European markets in morocco leather, carpets, and silk textiles, but it no longer competes with foreign products; even most of the fezes, the emblem of Turkish nationality, are made in Austria and other countries. Constantinople and Salonica have a few cotton, wool, and silk mills, but textiles are still the largest imports. House industries are carried on in a primitive way.

The Turks have little part in the trade of their country, most of the foreign trade being in the hands of English, French, and Belgian merchants. Armenians chiefly, and also Greek and Spanish Jews, are the merchants and bankers, yet only in Constantinople are modern banking and credit systems a part of business facilities. *

The grain, fruits, raw silk, tobacco, wine, perfumery, hides, and other articles that Turkey sells abroad pay for about one half of the textiles, sugar, coffee, coal, petroleum, iron, etc., which the country purchases. There are no trade statistics.†

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* Constantinople (Fig. 9), built around its magnificent harbor, the Golden Horn, stands at the meeting point of the East and West and commands the trade between the Mediterranean and the Black Sea. In any other hands than those of the Turks it would become one of the greatest ports in the world; as it is, the movement is about 15,000,000 tons a year, three fifths of which is under the British flag. Salonica is the port of western Turkey, and on the most direct route, via the international railroad, between west Europe and Greece. The Jews, three fifths of its population, are very active in commerce. Dedeagatsch, near the mouth of the Maritza River, exports Bulgarian wheat. Adrianople, the most important interior town, manufactures attar of roses, silks, and carpets.

† Asiatic Turkey is growing in importance with the extension of railroads. Smyrna, the most important city of Anatolia (Asia Minor),

STATISTICS FOR THE BALKAN PENINSULA

Rumania

Average Annual Trade (in Million Dollars)

	1881–'85.	1891–'95.	1899.	1901.	1907.
Imports	58.5	79.0	64.3	41.9	83.0
Exports	44.0	59.5	28.7	54.0	106.9

Imports from Leading Countries, 1908 (in Million Dollars)

Austria-Hungary.	Germany.	Great Britain.	France.	Italy.	Turkey.	Belgium.
18.9	28.1	13.4	4.6	4.3	2.8	2.6

Population (1908), 6,771,722.

Servia

Average Annual Trade (in Million Dollars)

	1884–'88.	1891–'95.	1901.	1908.
Imports	8.0	7.5	10.4	14.2
Exports	7.5	9.5	12.8	15.0

Population (1908), 2,825,000.

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is, next to Constantinople, the leading port of the Levant. Like Constantinople it is connected by rail with the far interior of Anatolia, and is the outlet for many of its exports. Chief among the manufactures are the famous Smyrna rugs and carpets made by thousands of families in the interior villages. The men color the wool with which the women and girls make fine and lasting products. Angora is the native home of the species of goat whose hair (mohair) is exported from Constantinople. The exports include the acorn cups of the Valonia oak sent from the Levant for dyeing and tanning.

Beirut, the chief port of Syria, has a railroad to Damascus, the largest city; a railroad also extends from Jaffa to Jerusalem. Syria exports wheat and wool and imports textiles and iron goods. Many small articles are made to sell to thousands of pilgrims. Most of the people are farmers. In Mesopotamia all land transport is by mule or camel. Bagdad caravans trading with Persia and the Black Sea; all manufactures are for home consumption; cereals and dates are the largest exports, the dates being sent all over the world from Basra, at the head of the Persian Gulf, where there is steam communication with India and England. The annual pilgrimages to Mecca, the burial place of Mohammed, give a season of great activity to Jedda, its port, where the trade in supplies is also very active. Hodeida, on the Red Sea, exports a part of the coffee of Yemen known as Mocha from the town on the coast that formerly exported this famous coffee bean. Mocha coffee is also shipped from Aden.

Bulgaria

Average Annual Trade (in Million Dollars)

	1880–'84.	1891–'95.	1901.	1908.
Imports	9.5	16.5	13.5	25.1
Exports	8.0	15.5	16.0	21.7

Population (1908), 4,158,000.

Greece.

Average Annual Trade (in Million Dollars)

	1879–'83.	1891–'95.	1901.	1907.
Imports	24.5	22.5	26.8	28.7
Exports	13.5	17.0	18.1	22.7

Population (1908), 2,632,000.

Turkey

Trade (in Million Dollars)

	1899.	1906.
Imports	117.1	135.2
Exports	59.1	84.8

Estimated population of the empire, 35,400,000; European Turkey, 6,130,200.

NOTES AND QUESTIONS

Rumanian industry, commerce and even agriculture, to some extent, are in the hands of foreign capitalists. Can the people profit as they should by their resources and industry under such circumstances?

The Greeks, Servians and Bulgarians are eager for science and progress. All these countries that have won their independence from despotic Turkey will eventually achieve great advancement.

CHAPTER XXXI

MEXICO

Most of Mexico stands on a high plateau. Temperate and even frigid influences prevail in the elevated interior, though tropical heat covers the low coast lands. Altitude has therefore larger effect than latitude upon business. Nearly all the plants found between the equator and the arctic circle grow in Mexico; the hot land * along the narrow coast is a region of cotton, henequen, mahogany, logwood, and tropical fruits (Fig. 131). Above the coastal zone, from 3,000 to 6,000 feet in elevation, are the "temperate lands," corresponding to southern Italy in vegetable products, a zone of subtropical plants, such as the cactus, on which the cochineal insect feeds (p. 113), besides maize, beans, and other food plants, and tobacco. Above 6,000 feet, on the plateau proper, are the "cool lands," bordered by mountain ranges, a region of wide, natural pastures, and of wheat, barley, apples, and many other products of the cooler latitudes, with deep valleys here and there where cotton and other subtropical products are grown. Most of the inhabitants live in this central region, where agriculture and mining are chiefly carried on. The extreme north has four seasons in the year, but south of latitude 28° the seasons are divided into the wet, from May till October, and the dry, from October till May.

The structure of the land and the resulting climate

* The oppressive heat in the harbor of La Paz, Lower California, led Cortez to name that region California—Hot Furnace.

present some impediments to industry and trade. Thus the mountain ranges bordering the plateau prevent wet winds from reaching the interior, so that most agriculture is carried on only with the aid of irrigation. As irrigation

Fig. 131.—Agriculture in Mexico.

is costly, there are fewer small farms in proportion to population than in the United States; north of the city of Mexico there are vast unimproved areas almost uninhabited, because capital and engineering skill have not yet led water from the mountains to fit the rich soil for tillage. Commerce must depend entirely upon the railroads, as none of the rivers is available for navigation. Access to the ports is difficult on account of the great differences in elevation.*

The harbors on the Gulf coast are naturally poor (Fig. 132). But a fine harbor has been made at Vera Cruz, and large sums have been spent to make that port and Tam-

* Trains from Vera Cruz climb 8,000 feet to reach the city of Mexico.

pico available for the needs of commerce. The best ports are on the Pacific coast, where they do not front the great

FIG. 132.—On the Atlantic coast Matamoras is a frontier town with a poor harbor (Bagdad), admitting only small vessels. Tampico accommodates steamers drawing 24 feet; as it is a railroad center, much of the foreign trade, particularly imports, pass through the city. Vera Cruz is the most important port of Mexico, but is unhealthful; most exports are shipped from this port, which has regular connections with New York, New Orleans, Havana, and St. Nazaire, France; the movement is about 700,000 tons a year. Coatzacoalcos is a small port at the north end of the Tehuantepec isthmus railroad. Carmen is a shipping point for mahogany and dyewoods; and Campeche for logwood. Progreso is the port of the industrial and trading town of Merida; most of the henequen of Yucatan is shipped from Sisal, northwest of Merida. On the Pacific coast, La Paz, the chief town of Lower California, exports fruit. Guaymas, a thriving town with a good harbor, connected by rail with the Southern Pacific Railroad, exports metals and hides and imports mining supplies. Altata is the port of Culiacan, a supply station for the silver mines. Mazatlan, with a shallow harbor and no protection against the west wind, exports metals and wood and imports manufactures. San Blas, with a fair harbor, is the busiest port between Mazatlan and Acapulco. Manzanillo is the port of the coffee, sugar, and cotton plantations on the plains of Colima. Acapulco, one of the finest harbors in the world, a coaling point for steamers, has as yet but little trade. Salina Cruz is the southern terminus of the railroad across the Isthmus of Tehuantepec. Much of the commerce between Mexico and the United States passes through the railroad towns on the northern frontier, mainly Ciudad Juarez and Ciudad Porfirio Diaz.

world market; but as they are shut off by mountains from the most populous and busiest parts of the country they have only a small share in the trade.

Most of the agricultural products are consumed at home (Fig. 131). The wheat raised on the high table-land is somewhat inferior to that of the United States. Maize and frijole (a black bean widely grown for food throughout Latin America) are the staple food of the people. All the cotton raised is spun in the mills; the best quality of fiber is grown in the neighborhood of Acapulco. One of the great exports is henequen (sisal fiber), used for sacking, cordage, and binder's twine (p. 103). The sales to the United States are making Yucatan one of the wealthiest states in Mexico. Superior vanilla, raised on plantations mainly in the state of Vera Cruz, is also a large export. The banana thrives everywhere on the lower mountain slopes, and the home trade is a source of much profit. Oranges, lemons, tobacco, coffee, cacao, rubber, and other southern products are very successful, but have not entered largely into the world's trade. One of the important plants is maguey, the American aloe, from which pulque, the national alcoholic beverage, is made. Considering the vast extent of fertile lands in Mexico, the republic is as yet utilizing only a small part of her agricultural resources in foreign trade.

Animal raising is growing in importance. It is still, however, in the early stages of development. Many large estates or haciendas on the plateau are devoted to raising cattle, mostly of the long-horned Mexican type, though the stock is being improved by importations from the United States. Hides and live cattle are exported to this country. Dairy farming is profitable near the large cities, where milk and butter sell at high prices. The wool crop is coarse and inferior, so that home mills import much wool of finer grades, while well-to-do Mexicans wear imported woolen cloths. The horses are small, but hardy and spirited. The

coast waters teem with fish; beds of pearl oysters in the Gulf of California supply a lucrative industry.*

Forests have been recklessly wasted. Many mountain slopes have been denuded of their timber to supply the mines. Much lumber is imported mainly from the Pacific coast of the United States. Mexico in return sells large quantities of mahogany and dyewoods to other countries.

Metals are the largest resource (Fig. 133). Mexico is one of the richest mining countries in the world (Figs. 68, 70).† More than half the silver has been produced on the plateau in the three districts of Guanajuato, Zacatecas and San Luis Potosi. The Beta Madre lode of Guanajuato alone produced $252,000,000 between 1556 and 1803. Lead associated with silver is a large product. Gold is found for the most part not on the plateau, but on the slopes facing the Pacific, and apparently in greatest abundance near the United States border, though it exists throughout the mountains. Gold mining is still in its infancy in most of these regions. Iron ore of fine quality is in inexhaustible supply. Fig. 133 shows the iron areas that are attracting most attention. Coal is found in various parts of the country, but comparatively little is yet mined. Mexican petroleum is refined at Tuxpan on the Gulf of Mexico. Pure sulphur from the crater of Mount Popocatepetl is exported from Puebla. Copper, mercury, and tin are also important

* Pearls are obtained chiefly from the pearl oyster, which is in largest supply in the Persian Gulf (Bahrein Islands), the Gulf of California, the north Venezuelan coast, the Sulu Archipelago, and off the west coast of Ceylon and the north coast of Australia. The product includes pearl or oyster shell (mother-of-pearl), which ranges in price from $300 to $900 a ton. The oysters are taken from a depth of 120 feet, with the aid of the diving dress, though most are gathered from depths of 40 to 50 feet.

† The total production of Mexican gold and silver mines between 1521 and 1875 is estimated at $3,614,000,000. The capitalized value of Mexican mines is about $375,000,000. There were 1,170 mines in operation in 1900, employing 95,523 persons.

MINING INDUSTRIES.

HOMESTAKE GOLD MINE, LEAD CITY, SOUTH DAKOTA.

products. As the precious metals, chiefly silver, are the larger part of the total exports, many steamers loaded with merchandise for Mexico can not secure return loads and consequently visit United States ports for cargoes.

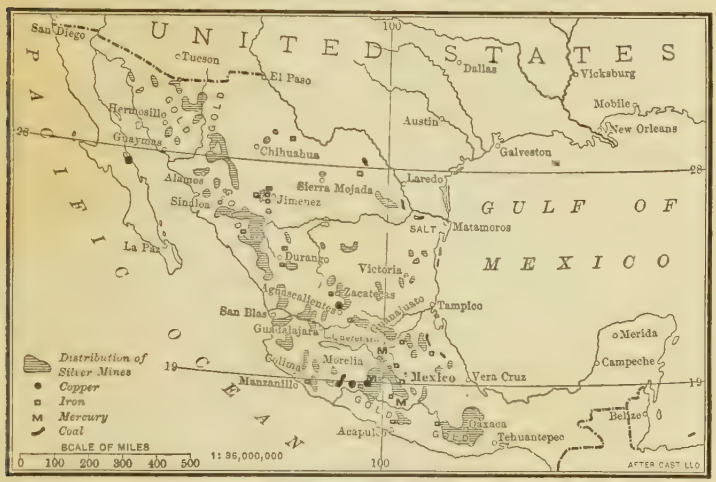

FIG. 133.—MINING IN MEXICO.

Many towns are supply stations for the mining centers. Chihuahua was founded over three hundred years ago in a rich silver-mining district. Durango, renowned for its rich silver group, has cotton and woolen mills and distilleries, owned mostly by Germans. Guanajuato smelts the silver ores of the Beta Madre mines, which yield about $5,000,000 silver a year. Zacatecas, famous for its silver mines, has potteries and cigar manufactures. San Luis Potosi (Fig. 132), a railroad-junction point west of Tampico, has become one of the largest cities through its mines and its trade in cattle, hides, and tallow.

Mexico, as well as all Latin America, is poor in industries. The products of these countries are chiefly raw materials; most industrial products, particularly articles of luxury and fine quality, are imported. The lack of political stability has had an important influence in preventing industrial advancement. Mexico, Argentina, and Chile have made the largest progress, Mexico in particular extending her manufactures to many branches, so that the imports are

decreasing. More than 140 cotton mills consume all the home cotton, import from Texas half the cotton they spin, and supply most of the needs of the country. Over twenty woolen mills make a variety of coarse fabrics. About 3,000 sugar mills supply the local demand. Paper, porcelain, soap, beer brewing, chocolate, glass, and drugs are among the other industries.

Railroads reach all the principal cities and the commercial and mining centers (Fig. 132). Connections are made at several points with the United States lines, so that the city of Mexico is now easily reached from all parts of this country. The capital city is the center of the wholesale trade, much of which is in the hands of German merchants and bankers. Nearly all the industries of the country are represented in its numerous shops and factories.*

The exports are larger than the imports. The greater part of the exports are precious metals; the other important products sold abroad are henequen, coffee, cattle, tobacco, tropical woods, hides, lead, copper, and vanilla. The principal imports are linen, woolen and cotton fabrics, hardware, and machinery. Half of the imports are purchased from the United States; England, France, and Germany supplying most of the remainder.

STATISTICS FOR MEXICO

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS, GOLD)

	1881–'85.	1891–'95.	Fiscal year 1900–'01.	1908–'09.
Imports.....	30.8	38.0	64.0	77.9
Exports	34.1	37.5	77.6	115.0

* Guadalajara, one of the largest cities, is famous for its potteries, and has cloth and other factories. Chilpancingo, south of the city of Mexico, is the center of a rich grain-raising district. Oaxaca, one of the garden spots of Mexico, has tobacco and chocolate works. Monterey is a railroad junction and the largest town of northern Mexico. Aguascalientes has hot springs and woolen mills; its fair in December distributes much merchandise through the interior. Puebla, one of the largest cities, has many industries.

PRINCIPAL EXPORTS, 1908–09 (IN MILLION DOLLARS, GOLD)

Minerals.	Vegetable products.	Animal products.	Manufactures.
73.6	34.6	7.1	1.3

Silver is the monetary standard, with the dollar (value in 1911, 51 cents) as the unit of coinage. The metric system is legal, but the libra (1.01 pounds), the quintal (101.6 pounds), and the vara (33 inches) are commonly used.

Population (1908), 15,000,000.

CHAPTER XXXII

CENTRAL AMERICA

Most Central Americans live on the Pacific slope. Their large towns and plantations occupy a long and narrow zone parallel with the Pacific shores and not very far from them. The western ports have most of the trade; civilization, in fact, has mainly developed in the west, while the Atlantic slope is largely wild and unoccupied. These facts are explained by the physical conditions: the hot lowlands of the east receive the tremendous rainfall brought by the moist trade winds; heat and rain produce almost impassable virgin forests, inhabited only by scattered bands of Indians (pp. 4, 5); the forests are rich in hardwoods and rubber, but too unhealthful to be the home of white men. In the west, however, rise mountain ranges and plains among them, protected by mountains from excessive rainfall and having a cooler climate as a result of their elevation. As the Pacific coast has a comparatively moderate rainfall the conditions favorable to planting and other industries are found along that coast and on the plateaus among the mountains.*

India rubber, mahogany, rosewood, dyewoods, cacao, and bananas grow on the hot lands to an elevation of 2,000 feet; coffee plantations are scattered over the temperate lands from 2,000 to 6,000 feet; most of the grain and

* The average rainfall at Greytown, on the Atlantic coast of Nicaragua, is 297 inches a year, while on the plateau at Granada, among the mountains, it is 65 inches.

northern vegetables are raised in the cool lands above 6,000 feet. Thus Central America, though wholly within the tropics, is enabled by its great diversity of surface to raise the characteristic products of every climate. As the main water divide is near the Pacific, the rivers on the Atlantic slope have the longer and gentler course, some of them being navigable for a considerable distance. Railroads have been built from some of the ports to the uplands where coffee is grown. Among the commercial disadvantages are the poor common roads, traversed by two-wheeled ox carts, the earthquakes which sometimes inflict great damage, the poverty of the masses, the small development of manufacturing, and the internal political disturbances.

Guatemala is the most important of the five republics; it sells more to foreign lands and buys more from them than any other state (Fig. 134). With a very narrow frontage on the Atlantic, most of the country is an elevated plateau. Coffee, the most important crop, grown mostly on large plantations by well-to-do planters, thrives from the Pacific to the center around Coban. Maize and black beans, the staff of life throughout Central America, grow everywhere. The crops indicated in Fig. 134 supply most needs except textiles and flour. All the sugar is consumed at home, the rum distilleries using much of it. The cotton fields and the high, dry sheep pastures supply fibers for the spinners and weavers who ply their trades in the towns. Cattle on the plateaus yield hides for export. Many minerals await development, but mining is in its infancy, the most important being placer-gold washing in the south, supplying metal for a small quantity of home-made gold ornaments. Straw, wooden and earthen wares, tobacco, and leather are other industries.

The largest river, the Motagua, is navigable at high water for 100 miles; a railroad extends up its valley to Guatemala, the capital, which is also connected by rail with the Pacific ports of San José, the leading port, and

FIG. 134.

Champerico, which are merely roadsteads. Much of the rubber, bananas, and other resources are still unavailable for lack of transport.*

Guatemala leads in the exports of coffee. This commodity is the largest item in Central American shipments. No other Guatemalan export is of much importance, though

* The Atlantic ports, Livingston and Puerto Barrios, and the two Pacific ports ship large quantities of coffee; Guatemala, standing high and sheltered from the trade winds, is the largest city in Central America and the center of the Guatemalan trade; Quezaltenango, built of lava blocks quarried at the foot of a volcano, makes woolen and cotton cloth; Coban, in the center of one of the most fertile and healthful districts, is a busy trading place, and sends coffee to Livingston for export.

considerable quantities of bananas, hides, rubber, mahogany, and cedar are sold abroad. About an eighth of the coffee comes to the United States and the remainder is sent to Europe, Germany being the largest buyer. Cotton goods, hardware, flour, and wine are the largest imports, Great Britain and Germany having the largest part in the import trade.*

Honduras, though rich in resources, has little commercial development. The country has a large Atlantic and very small Pacific frontage. Its large extent and sparse population make it difficult to secure sufficient labor. Fully half of the land, lacking population and transport, is still a virgin waste.†

The agricultural products scarcely met the local demand until recent years, when it was found that bananas, cocoanuts, and other fruit might profitably be exported from the Bay Islands and the north coast to the United States. A single schooner was in this trade in 1883, while to-day several steamers carry a large amount of fruit to the United States every year. The success of the fruit trade has stimulated the opening of coffee and other plantations. Many hides and cattle are exported. The Atlantic forests abound with fine timber, Honduras mahogany being especially famous. The country is rich in gold and silver, which are the leading exports;‡ cattle, fruits, timber, cacao, tobacco,

* The imports in 1908 were valued at $5,812,000, the United States sending $1,719,000; exports $6,756,000, the United States taking $1,777,000. Population (1908), 1,883,000.

† It takes a mule train three weeks to travel between Puerto Cortez on the Atlantic and the Pacific port of Amapala, a distance which might easily be covered in half a day if the projected railroad between those ports were built. Mahogany, sarsaparilla, and hides are carried by mules from the upper Patuca River to Trujillo for shipment.

‡ Amapala, one of the best natural harbors on the Pacific coast, is nearest the mines, and metals are therefore among the largest exports. The Atlantic ports, Trujillo, Ceiba, and Puerto Cortez, have connections with the United States. Ceiba is engaged chiefly in the fruit trade.

and coffee are other important exports. The imports include cotton goods and hardware, more than half the entire trade being with the United States.*

British Honduras, covered with forests, exports chiefly their products. Mahogany, logwood, and other timber is felled in the interior and floated down the rivers, the quantity available for export depending on the amount of water in the streams to float the log drives. Bananas and cocoanuts are also sent to the United States. Most of the timber goes to Great Britain, and the fruit to New Orleans. England and the United States divide the imports.†

Salvador is the smallest country in America. Fronting wholly on the Pacific coast, practically all of it is available for settlement; it is therefore more densely peopled than any of the other republics. The products distinguishing it from the other countries are balsam of Peru, valued in medicine,‡ and indigo, once the largest export, but now surpassed by coffee, which is three fifths of the value of the total sales abroad. Salvador has the largest coffee export except Guatemala. There are hundreds of sugar plantations. Cattle, horses, and mules are imported from Honduras, as stock raising does not fill the demand. The mining industry is unimportant, though some silver is exported. San Salvador, the capital, is the center of trade. Santa Ana, next in size, owes its prosperity to coffee and sugar planting. San Miguel is a trading center. San Vincente has fairs at which many commodities are exchanged. Most of the exports are shipped through La Libertad and Aca-

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Tegucigalpa, the capital and largest town, is in the gold and silver region; Comayagua is a cattle-raising center; Jutigalpa is noted for its placer-gold diggings.

* The foreign trade in 1908 was: Exports, $1,859,000; imports, $2,754,000. Population (1900), 587,500.

† Population (1901), 37,479.

‡ Balsam of Peru was so called because the Spaniards used to carry it to Callao, Peru, for shipment to Spain. It grows on the coast plain between La Libertad and Acajutla.

jutla, though La Union, on the Gulf of Fonseca, has the best harbor. Coffee, indigo, sugar, tobacco, and silver are the principal exports; textiles, hardware, flour, and firearms are the chief imports. About half the imports come from England; the United States, Germany, and France following; the exports to these countries are about two thirds of the total trade.*

Nicaragua's resources are but little developed. The east is covered with great forests. Civilization, centered on the Pacific coast, does not extend more than 100 miles inland. Coffee, the principal product, is grown around Leon, Granada, and Managua, where nearly the whole product is raised. Large areas near the east coast are adapted for the banana, but the only plantations are along the Rama (Bluefields) River, which alone provides a highway to the sea, the river being navigable by steamers for 65 miles. The forest wealth is little developed. Wild-rubber plants, however, have been so recklessly destroyed that the exportation of rubber, except from plantations, has been prohibited till 1907. Many cattle graze on the northwest plateau, and hides are an important export.

Greytown and Bluefields are the Atlantic ports, but Greytown is no longer accessible for large vessels. Corinto and San Juan del Sur are the Pacific coast ports, most of the trade passing through Corinto, which is better protected and is connected by rail with the large interior towns, Granada, Masaya, Managua, Leon, and Chinandega. As the settled part of the country is almost inaccessible from the Atlantic coast, the trade passes between Corinto and the Isthmus of Panama.†

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* The exports to the United States in 1908 were $1,954,000; imports from the U. S. (from our Treasury returns), $1,287,000. Population (1908), 1,707,000. Total trade (1908): Imports, $4,241,000; exports, $5,896,000.

† Fig. 134 indicates the route of the proposed canal: By canal from Greytown to the San Juan River; the river to Lake Nicaragua; canal from the lake to Brito (p. 44).

The principal exports are coffee, gums, hides, timber, bananas, and cattle. The United States takes about half of the exports, followed by Great Britain, Germany, and France. Most of the imports, textiles, hardware, flour, and other articles, come from the United States and England.*

Costa Rica excels in the quality of its coffee. It brings a high price in foreign markets. Nearly a third of the population live on the dry side of the mountains, where the largest coffee plantations are scattered for 50 miles around San José, the capital.† Cattle thrive on the uplands, though not enough meat is produced for home consumption. Puerto Limon, the Atlantic port, is connected with San José by rail. The Pacific port is Punta Arenas. Coffee is about half the exports, a third of the crop going to England; then come bananas, hides, cedar, gold, rubber, and tortoise-shell. The imports are hardware and general manufactures, the United States leading in this trade. ‡

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* Estimated exports in 1908, $4,500,000 : imports, $3,000,000. Population (1908), about 500,000.

† When the coffee berry is ripe in December all the men, women and children available pick the crop. The berries are washed, then dried in the sun and taken to factories, where the crop is prepared by modern machinery for market. Most of the coffee is bought by agents of foreign firms several months before the harvest.

‡ Costa Rica's export trade in 1908 was $7,758,000 ; imports, $5,629,000. Population (1908), 360,000. Complete commercial statistics for Central America are not available. Silver is the monetary standard in all the republics, with the peso or dollar (value about 49 cents) as the unit of coinage.

CHAPTER XXXIII

VENEZUELA, THE GUIANAS, AND BRAZIL

The Atlantic slope of South America is of much greater commercial importance than the Pacific slope (Fig. 23). It includes most of the continent; it has the best harbors; its rivers provide nearly all the interior navigation; the products of its forests, grazing lands, and farms are much more valuable than the commodities of the Pacific slope.

Venezuela has vast resources and small population. Lacking sufficient labor, its plantations are poorly tilled; large, fertile areas are unoccupied; the donkey and mule are the sole means of carrying merchandise between the coast railroads and the people of the far interior. As more inhabitants are needed, Venezuela offers special inducements to foreign immigration (p. 36).

The republic has hot, temperate, and cool zones according to elevation, each having its characteristic products. In the northwest are lowlands (Fig. 135), very hot and unhealthful, producing much cacao. South and east of the lowlands are high mountain ranges, skirting the sea from Valencia to Caracas, with plantations in the valleys where nearly all the agriculture is centered. The inhabitants live chiefly among these mountains, where the climate is comparatively healthful. The llanos, or great plains, extending south of the mountains, though hot and malarious, provide grazing for millions of cattle. The high plains south of the Orinoco are also unhealthful, and yield little except forest products and gold.

Coffee is the main staple of wealth. Caracas, Valencia, and other important towns are in the midst of the largest coffee * districts. Nine tenths of the crop, which averages 55,000 tons, is shipped to Europe and the United States.

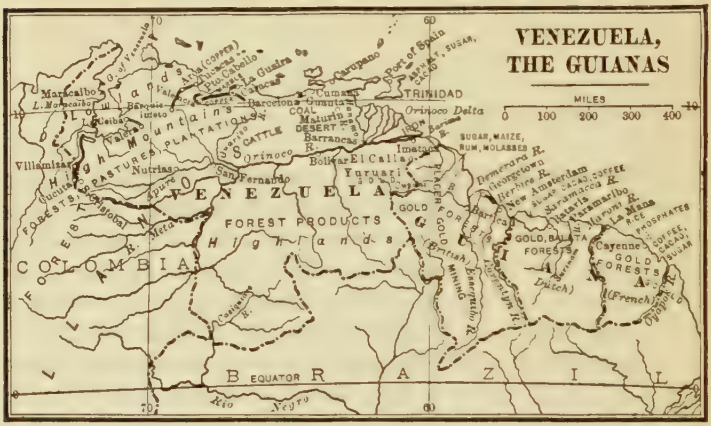

FIG. 135.

Cacao, produced in the torrid lowland and the lowest parts of the valleys, is the second largest agricultural export, seven eighths of the crop being sold abroad. These industries are embarrassed by the frequent revolutions which restrict the investment of capital in planting.† The importation of sugar is prohibited by law, with the result that all the coarse brown sugar, the only

* The bush grows in the shade of trees to avert the blasting effects of the sun. When ready for market the coffee is sent on donkeys and mules to the chief commercial centers, where it is purchased by foreign agents and forwarded by rail to the northern seaports.

† The British minister to one of the South American republics long had in his office two water colors, one showing a coffee plantation at 8 A. M., everybody happy and work in full progress, the other showing the same plantation at 5 P. M., with dead and wounded men on all sides.

quality produced, is sold in the country at high prices. Tobacco is insufficient for home consumption. Havana cigars are an important import, as domestic cigars are not well made.

Cattle raising is next in importance to agriculture. The llanos (Fig. 135), nearly as large as Texas, are covered with rich grasses that would feed many millions of cattle, but civil wars have interfered severely with the industry. The cattle are mostly long-horned, small-bodied animals, which are driven in great numbers to the mountain towns for beef, but are worth little for export except for hides.*

Among the forest products are rubber, tropical woods, and tonka beans,† which yield considerable exports.

Gold is the only mineral of importance exported. It comes chiefly from El Callao district in Yuruari (Fig. 135), where the placer diggings have been nearly worked out, and quartz crushing has not yet been developed. Later discoveries of gold nearer to Ciudad Bolivar, on the Orinoco, and elsewhere bid fair to keep up the exports.‡

Manufacturing is only for the most common needs. Thus soap made from cocoanut oil and candles from imported stearin are important, because high duties give the local products a monopoly in cheap grades. Matches, straw goods, rum, feather flowers, cheap hats, shoes, and sole leather are other articles produced. Practically no manufactures are exported, but they comprise most of the imports.

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* Some cattle, driven south to the Orinoco, are shipped to Cuba and Porto Rico.

† The tonka bean, which is used for perfuming purposes, is the seed of a tall tree growing in Venezuela and the Guianas.

‡ Much copper has been exported from Aroa through the port of Tucacas, but the output is now small. Coal mined near Barcelona is used to some extent by shipping, but more is imported from Cardiff. Marble of a superior quality is quarried near Puerto Cabello. The pearl fisheries at Margarita island are again becoming important (1901).

The commercial centers among the mountains are connected by rail with their ports (Fig. 135). A railroad line, passing through the heart of the best agricultural regions, unites Caracas, the capital and center of the largest trade, with Valencia. A number of steamship lines ply between the northern ports and the United States and Europe.*

The annual value of imports is the barometer of Venezuelan prosperity. The reason is because all breadstuffs, cottons, woolens, kerosene, and many other articles of every-day use are obtained from abroad. If there is a serious falling off in imports of these essentials of comfort the country is not prosperous. The United States sends flour, lard, kerosene, hardware, and cotton textiles, all of which pay heavy duties in Venezuela, while Venezuelan coffee, cacao, and skins are admitted free into this country. The imports from the United States head the list in value, England coming next with cottons, woolens, and general manufactures, then Germany with cutlery and various wares, followed by France with silks and fancy goods, and Spain and Cuba with wines and

* La Guaira, the port of Caracas, is an open roadstead turned into a good harbor by breakwaters; it handles a fourth of the imports and most of the cacao exports. Puerto Cabello, the best harbor, is the port for the large region of which Valencia is the business center. Maracaibo can not be reached by the largest vessels, but has the advantage of navigation on Lake Maracaibo, making a rich region tributary to it, so that it sends out the larger part of the coffee shipments. San Cristobal, Valera, and La Ceiba are shipping points for coffee and cacao exported through Maracaibo. The market for imports at Maracaibo is the region east and south of the lake. Tucacas is the port for the fruitful high plain of which Barquisimeto is the thriving trade center. The small foreign trade of Barcelona passes through its port, Guanta. The port of the south is Ciudad Bolivar, on the Orinoco, which, with its Meta tributary, is navigable from the interior of Colombia to the ocean and through a northern branch of the delta to the channel separating Trinidad from the mainland. Ciudad Bolivar ships rubber and Barrancas exports cattle. The Orinoco region has very little development. Nutrias and San Fernando are collecting points for cattle. The cacao industry is particularly thriving around Maturin.

tobacco. The chief exports are coffee, cacao, hides, and gold.

The most important industries in the Guianas have been the growing and manufacture of cane sugar and its by-products, rum and molasses. The lessening value of cane sugar caused great depression in these colonies, commercial disaster following dependence on this one crop. The people of British Guiana were turning (1900) many of the old sugar plantations into rice and tobacco fields, giving also much attention to cacao. Sugar has been largely replaced in Dutch Guiana by cacao and coffee. British and Dutch Guiana are alike in physical features, climate, and products. The low, marshy coastal plain, fertile, hot, and unhealthful, is devoted to planting. Cultivation is confined almost wholly to this narrow strip, and most of the inhabitants live there. Behind the plantations is a sandy zone, once the margin of the ocean when the present coastal plain was under the sea; then beyond the sandy zone is a rough, hilly country covered with forests and yielding considerable gold.*

Georgetown (Demerara) and New Amsterdam, the chief towns of British Guiana, owe their importance to the palmy days of the sugar trade. The Demerara railroad was the first in South America. Bartica is an outfitting place for the gold diggings. Most of the laborers are East Indian coolies. The principal business interests are in the hands of British colonists. The imports include manufactures, coal, flour, dried meat, wine, and butter. About half the imports come from Great Britain and more than a fourth from the United States. Sugar, gold, rum, india rubber (balata), rice, and molasses are sent mostly to Great Britain and the United States, each having nearly half the trade.†

* The gold yield of British Guiana in 1891 was $1,900,000, and in 1908, $1,227,670. The gold exports of Dutch Guiana in 1907 were $570,000.

† Paramaribo, at the mouth of the Surinam river, is the commercial center of Dutch Guiana. The products and exports are indicated in Fig. 135. Nearly the entire trade is with the Netherlands. French

Brazil is the largest producer of coffee and rubber in the world. Coffee is the most important crop of the highlands, which cover half of the country between the sea and the basin of the Amazon river. Rubber is the most important product of the lowlands, which comprise half of the country in the Amazon plain (Fig. 136). The lowlands, lying under the equator, deluged by trade-wind rains, covered by dense tropical forests, are hot and unhealthful, and have few inhabitants (pp. 4, 6). The inland part of the highlands is dry and steppe-like in character and sparsely populated, while the coastal zone is a region of plantations, fairly well tilled, and in the most favored districts well populated; here are all the most important cities. Brazil, nearly as large as the United States, is wholly in the tropical and subtropical zones, except the extreme southern states, which enjoy a temperate climate. The negroes, now free but originally brought from Africa as slaves to till the plantations, are most numerous in the tropical states; the whites, mainly Brazilians (Portuguese) and many German and Italian immigrants, are most numerous in the uplands of Minas Geraes, the states of Rio de Janeiro, São Paulo, and the fertile and temperate states of the south.

Coffee is the great staple of the export trade (pp. 71, 75). It contributes more to the commercial importance of Brazil than all the other agricultural products. Most of the railroads were built, primarily, to carry coffee to the seaports. It made Rio de Janeiro the commercial center of Brazil and the second largest city in South America. Coffee can be grown anywhere from the Amazon to São Paulo, but nearly all the production is centered in the states of Rio de Janeiro

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Guiana is less developed than the other colonies, there being comparatively few plantations. It differs from them also in having comparatively high coast lands and in including phosphates from the islands among the exports. The harbor of Cayenne is adapted only for small vessels. The trade is chiefly with France.

FIG. 136.—Rio de Janeiro, the largest city, has a fine harbor, and is the political, commercial, and industrial center. Santos is the largest coffee-shipping port. Porto Alegre is the port of the German colonies in South Brazil. Campos is one of the most important towns in the state of Rio de Janeiro. Victoria, the chief town of Espirito Santo, exports considerable coffee. Bahia, with one of the best harbors, exports coffee, tobacco, and timber. The state of Sergipe is particularly rich in costly woods exported from Aracaju. Sugar is shipped from Maceio. Pernambuco, one of the finest harbors of the land, exports chiefly sugar and coffee. Natal is the small port of Rio Grande do Norte. Ceara is the outlet for the sugar and cotton of the fertile state of that name. Maranhão is one of the most prominent of the smaller ports in the coast trade. Para ships nearly all the rubber. As no railroads connect these ports, the coast traffic from one port to another is important. A great deal of the cotton of the north, for example, goes to the southern factories by sea. Observe the short railroads extending from the ports to the plantation districts.

The Amazon affords larger interior navigation than any other river system in the world. Ocean vessels ascend the river to Iquitos in Peru. Observe the confluence of waterways at Manaos, 1,000 miles up the Amazon, that have made it a large trading center. It is the depot for all the rubber collected in the upper valley. River steamers ply between Cuyaba in Matto Grosso and Buenos Aires.

and São Paulo. In São Paulo about 1,000,000,000 plants are in cultivation, this state contributing the larger supply (Fig. 136). Most of the crop is shipped from Rio de Janeiro and Santos, the port of São Paulo.*

Cotton, raised mainly in the northeastern states (Fig. 52 and p. 95), is not so important in foreign trade as formerly, but is still a considerable export to Europe. Most of the crop is consumed in the home factories. Sugar, formerly very important for 1,800 miles along the east coast, has declined on account of low prices. It supplies the home demand, and much is exported through Pernambuco. The tobacco of Bahia and Minas Geraes supplies all the leaf needed for cigars and cigarettes and a large surplus for export. Many thousands of cattle raised most extensively on the campos of the south are slaughtered every year; the meat is dried in the sun, some of it being exported to Cuba, but far larger quantities and many beef cattle are imported from Argentina and Uruguay; hides, hair, horns, and bones (in the form of bone ash, used as a fertilizer) are sent to Europe and the United States. As dairying is neglected, foreign butter has a good market. Swine are fattened in large numbers in the south, but much lard and pork is sent from the United States.†

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* Brazilian coffee is particularly rich in caffeine. In the cooler climate, where it is grown, the shrub does not need the protection of shade trees as in Venezuela. Some of the coffee estates embrace as much as 50,000 acres, giving employment to thousands of laborers; they are equipped with the best machinery, and branch railroads run to the doors of the factories that prepare the crop for market. The berries are picked from May till September, graded in seven qualities, and shipped in sacks, each containing 132 pounds. In good years the crop amounts to over 13,000,000 sacks. The industry has suffered in late years from reduced prices, due to overproduction. About nine tenths of the crop is exported to the United States, Europe, South Africa, and the Plata river countries.

† Animal products to the value of several million dollars are annually exported.

Rubber is second only to coffee in the exports (p. 112). Several qualities are derived from various rubber trees growing throughout the Amazon basin. The trees are tapped or cut down and the coagulated sap (rubber) is taken to collecting points, and from time to time carried by boats to Manaos, Para, and other markets. The quality known as Para rubber brings a higher price than any other; the price of the crude rubber is fixed in foreign markets, chiefly in New York and London, the quotations being cabled to Para, which is the shipping point for nearly all the rubber,* for the guidance of purchasing agents there.

Among other forest products are Brazil nuts, the largest supplies coming from the Rio Negro.†

Mineral products are very small, though gold and diamond mining is carried on to some extent, chiefly in Minas Geraes. The diamond industry was nearly ruined by the discovery of the South African diggings (p. 133); the gems are of the finest quality, and the output (about $250,000 a year) is cut at Diamantina and the neighboring villages.

Manioc, black beans, and rice are the chief articles of food.‡ Yams, maize, sweet potatoes, bananas, and arrowroot are also important food resources; very little food is imported

* As the supply of wild rubber bids fair to become exhausted in time, increased attention is being given to the cultivation of caoutchouc. Rubber grown on plantations is likely to be the chief source of supply. Over 35,000 tons of crude rubber are exported from Para every year.

† Brazil derives its name from the Brazil tree, which yields a dyeing material. The Brazil nut derives its name from that of the country.

‡ The standard dish on Brazilian tables is a mixture of manioc flour, black beans, and rice, with bacon or jerked beef imported from La Plata countries. The root of the manioc plant is widely cultivated in tropical America and Africa, where it is the chief food of millions of people. Tapioca, a large export to northern countries, is prepared from manioc starch.

for the poorer classes, but a great deal for the more prosperous part of the whites. Rice thrives on the lowlands, but large quantities are imported. The cereals of the temperate zone are little cultivated, though wheat thrives in the south. Most of the wheat and flour consumed is imported. Though agriculture has been considerably extended in recent years, Brazil still has less land in tillage, in proportion to area, than almost any other country. The methods of cultivation are very primitive except on the large plantations, but the neglected fields yield abundant food for the peasantry.

Manufactures have only meager development. Nothing else could be expected in a land where coal and iron are in small supply. Still some iron is smelted. Over 100 cotton factories work up most of the Brazil cotton; in all well-settled regions there are sawmills, brick yards, tanneries, and other establishments, which supply most of the primary necessities, such as furniture, coarse cottons and woolens, hats, leather, matches, candles, and some machinery.*

The imports are mainly foodstuffs, coal, machinery, and articles desired by the well-to-do classes. The exports are confined mainly to a few products of the plantations and the forests. Among the food products most largely imported are flour, cattle, jerked beef, rice, codfish, lard, butter, wines, and spirits. Cottons, woolens, iron, machinery, and coal are large purchases, most of them coming from England. Most of the hog products, half of the flour, and all the kerosene come from the United States. Coffee, rubber, tobacco, hides, and cacao are the leading exports. Fifteen steamship lines connect Brazil with Europe and North America. Over thirty foreign mail-carrying steamers visit the various ports every month.

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* Very high duties, amounting in some instances to more than the value of the goods, are imposed. If it were not for this protection, it would be impossible to carry on the textile industries. Agricultural machinery and implements are lightly taxed, but the imports are small.

STATISTICS FOR VENEZUELA, THE GUIANAS, AND BRAZIL*

Venezuela

Imports to Venezuela from Leading Countries (in Million Dollars)

	1898.	1908.		1898.	1908.
United States	2.7	2.5	Germany	1.0	2.2
Great Britain	2.2	3.6	Spain	0.3	0.6
France	0.4	0.2			

Total imports, 1908, 10.2; exports, 14.6.

Exports from Venezuela to Leading Countries (in Million Dollars)

	1898.	1908.		1898.	1908.
United States	6.6	5.8	Germany	2.4	0.8
Great Britain	0.2	1.2	Spain		0.6
France	7.1	4.8			

Population (1908), 2,647,000.

The monetary standard is gold and silver, with the bolivar (19⅓ cents, gold) as the unit of coinage.

The Guianas

Average Annual Trade of British Guiana (in Million Dollars)

	1881–'85.	1891–'95.	1899.	1902.	1908–9.
Imports	9.5	8.5	6.3	6.9	9.1
Exports	13.0	11.0	9.2	10.3	10.5

Population (1908, estimated), 304,089.

Annual Trade of Dutch Guiana (in Million Dollars)

	1895.	1899.	1907.
Imports	2.3	2.4	1.4
Exports	2.1	2.2	1.4

Population (1899), 82,300.

Annual Trade of French Guiana (in Million Dollars)

	1895.	1903.		1899.
Imports	2.3	3.0	Trade with	2.0
Exports	1.9	2.5	France.	0.06

Population (1908), 34,962.

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* Commercial statistics of Venezuela and Brazil are incomplete, and partly estimated.

BRAZIL

Average Annual Trade (in Million Dollars)

	1881–'85.	1891–'95.	1900.	1902.	1908.
Imports	106.7	150.0	97.3	113.3	172.3
Exports	116.0	177.5	165.5	177.3	214.3

Trade with Leading Countries, 1908 (in Million Dollars)

	Imports from Brazil.	Exports to Brazil.		Imports from Brazil.	Exports to Brazil.
United States	88.5	21.1	France	16.6	16.0
Great Britain	32.6	51.0	Argentina	9.0	18.0
Germany	34.4	26.3	Belgium	4.6	8.0

Population (1908), 21,000,000.

Gold is the monetary standard, with the milreis ($54\frac{3}{5}$ cents) as the unit of coinage; but the actual circulating medium is mostly inconvertible paper, together with nickel and bronze coins. Metric weights and measures.

NOTE

The price of beef is increased by the high cost of transportation to the sea, which prevents Brazil from competing with Argentina in the European meat markets.

CHAPTER XXXIV

PARAGUAY, URUGUAY, ARGENTINA, AND CHILE

Paraguay has rich but undeveloped resources (Fig. 137). It is a plain surmounted by low mountain ranges, mostly covered with great forests, with wide, open spaces intervening that provide fine pastures and fertile farming lands. The climate is healthful and, though warm, is not oppressive. The disadvantages are sparsity of population, very poor interior communications, and lack of capital.*

Though an interior country, Paraguay has as yet no rail connections with the sea. The Paraguay and Parana rivers, however, provide sea communications, all the interior commerce being carried on these rivers; above their junction the Parana is navigable for only 250 miles to Encarnacion. Large steamboats ply between Asuncion, the capital, and Montevideo and Buenos Aires, but their high freight rates are a commercial disadvantage.

Yerba maté is the most important export (Fig. 46). As it is cheaper than tea, its use as a beverage is constantly growing. The exports in 1896 were 5,000 tons, and in 1908 over 9,000 tons.†

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* To encourage immigration the Government pays the passage of immigrants from Buenos Aires, gives them land, and loans them implements and money without interest. The immigration, however, is very small.

† Yerba maté (the maté herb, also called Paraguay tea) is a shrub growing wild in the forests and in neighboring districts of Brazil; it is also cultivated on a few plantations, whose product is said to be superior. The leaves, rich in caffeine, are withered, rolled, and sorted, about half the crop being consumed at home and the remainder sent in bags

Hides are the second largest export. They are practically the only animal product sent out of the country except live cattle, shipped to the jerked-beef establishments of the south, and a little sole leather.

Few small countries are as rich as Paraguay in valuable woods. But with a market at their doors, the Paraguayans are unable to meet more than a part of the demand from Argentina and Uruguay for railroad ties, building timber, and cabinet woods. It is so difficult to deliver timber at the rivers for shipment that Argentina finds it cheaper to buy most of its woods in North America and Europe.*

Few agricultural products are exported. Oranges and pineapples are the most important exports of the orchards and tilled lands, which are mostly along the banks of the rivers for convenience of transport. Oranges are so plentiful that hogs are fattened on them. Manioc and maize are the food staples; sugar cane, ramie fiber (p. 103), and coffee are grown for home consumption. All the soap is made from cacao oil. Cotton thrives, but little is grown, cotton textiles from England and Germany being the largest import. Much tobacco is sent to Argentina, where it is mixed with Cuban and other leaf and made into cigars and cigarettes. All the wheat comes from Argentina; the poor, however, can not afford to eat it.

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to Argentina, Uruguay, and other South American countries, where it is sold chiefly to the country people, who regard it as an excellent substitute for tea and coffee. As the decoction is sweeter than tea, it is drunk with little or no sugar; it is stimulating and to some extent a substitute for food.

* In 1896 the Great Southern R. R. of Argentina purchased a large quantity of ties in Australia, because Paraguay had no facilities for turning out the supply required in the stipulated time. In many ways Paraguay suffers from lack of good roads. Oranges, after jolting for days in bullock carts, are hardly worth exporting when they reach the shipping points. When the small rivers are very low a considerable part of the maté crop can not be delivered at the Paraguay and Parana rivers for shipment.

CHILE, ARGENTINA, PARAGUAY AND URUGUAY
SCALE 1: 23,000,000
MILES
0 100 200 300 400 500
NITRATE PORTS
Arica
Pisagua
Iquique
Patillos
Tocopilla
Antofagasta
Taltal
Caldera
Copiapo
La Serena
Coquimbo
Valparaiso
SANTIAGO
Talca
R. Maule
Constitucion
Chillan
Concepcion
Talcahuano
COAL
Arauco
Lebu
Imperial
Valdivia
Puerto Montt
Ancud
I. CHILOE
AGRICULTURE
WOOD CUTTING
FISHING AND FOREST INDUSTRIES
GUANO
NITRATE OF SODA
Rainless or very little Rain
SULPHUR
GYPSUM
TIN, LEAD, IRON
GOLD, NICKEL
COPPER
FORESTS
PASTURES
RAIN FIELDS
FERTILE
PACIFIC OCEAN
CHILE
the Andes
MINING
Cordillera of the Andes
TIMBER
B O L I V I A
GRAN CHACO
ARGENTINA
PATAGONIA
BRAZIL
HIDES AND SKINS
Jujuy
Salta
SUGAR, TOBACCO
Tucuman
HIDES AND GOATSKINS
Catamarca
Rioja
San Juan
CATTLE, WINE, FRUIT
Mendoza
S Luis
Mercedes
Lucerne Cattle
JERKED BEEF
Sheep and Cattle
Santiago del Esterro
Sheep Cattle
Pilcomayo
Bermejo R.
TIMBER
YERBA MATE, FRUIT, TIMBER SUGAR
CATTLE, TOBACCO, CANE
Concepcion
V.S.Pedro
PARAGUAY
Rosario
ASUNCION
SALT
Paraguari
Villa Rica
TIMBER
Villeta
Tabapy
Carapegua
Villa Pilar
Encarnacion
Cattle
Corrientes
Parana
YERBA-MATE
JERKED BEEF
Cattle
BUTTER & CHEESE FACTORIES
Cattle
MAIZE, WHEAT
WHEAT, FLAX
St. Elena
Santa Fe
Parana
FLAX
WHEAT, MAIZE, JERKED BEEF
Rosario
FLAX
BUENOS AIRES
WHEAT
La Plata
Sheep and Cattle
Bahia Blanca
Colorado
R. Negro
G. of San Matias
R. Chubut
Rawson (Chubut)
G. of St. George
Santa Rosa
GOLD, SILVER, COPPER
WINE
Salto
Cattle, Sheep Pastures
Paysandu
URUGUAY
MAIZE, WHEAT, ALFALFA, JERKED BEEF, MEAT EXTRACTS
Colonia
San Jose
MONTEVIDEO
Maldonado
Rio de La Plata
ATLANTIC OCEAN
20
30
40
60
70

FIG. 137.

There are few manufactures. Spirits are distilled from sugar-cane juice; and brick, earthenware, leather tanning, furniture and cigar making are industries in Asuncion and a few towns.

About half the imports come from England. As all the people dress in cotton fabrics, these textiles are the principal foreign purchases, followed by wine and rice. Yerba maté, hides, timber, tobacco, and oranges, in this order, are the important exports.*

Uruguay's wealth depends upon its pastoral industries and agriculture. Its surface is an undulating, grassy plain, intersected by low mountain ranges. The climate is temperate and healthful, the soil is fertile, and the rainfall abundant. Bounded on three sides by the sea and the navigable La Plata and Uruguay rivers, it has a very favorable position for trade. Its disadvantages are civil wars, which have greatly retarded development, and a sparse population, with the resulting inadequacy of labor. Most of the land is held in large estates.

Grazing is the largest industry (Fig. 137).† The cattle, resembling our Texan cattle, but smaller, have been much improved since 1885 by the introduction of Durham, Holstein, and other breeds. The rich district around Paysandu produces the best beef cattle, this town and Montevideo being great slaughtering centers. About 800,000 cattle are killed annually with little waste, horns and bone ash being

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* The foreign trade is included in the statistics of the Rio de la Plata countries (Argentina and Uruguay). Thus, while we send hardware, kerosene, and canvas to Paraguay, and buy hides and essences, our treasury returns show little or no trade. Approximate statistics of the total foreign commerce are obtained from the returns of the Paraguay custom houses.

† Mulhall (1894) estimates the annual value of the animal products at $37,500,000; farm products, $12,500,000. There are 7,000 cattle and 19,450 sheep for every 1,000 of the population, a larger proportion than in any other country in the world.

exported and refuse turned into fertilizers. Four fifths of the cattle are used in making "tasajo," jerked beef,* which is exported to Brazil, west South America, Cuba, and Porto Rico. About 150,000 cattle are slaughtered every year at Fray Bentos for the manufacture of meat extracts. Corned beef and salted and canned beef tongues are sent to Europe; exports of refrigerated beef and mutton are becoming important.

The export of wool, which has more than doubled since 1880, is the largest item in the sales to foreign lands. It is sent to the cotton-spinning countries of Europe and to the United States.

Wheat and wheat flour comprise most of the agricultural exports. Wheat is sent to Europe and flour to Brazil, which buys more flour from Argentina and Uruguay than from any other countries. Most of the cereals and other farm products, however, are consumed at home, but the tendency is to plow more land in order to increase the production. Except in years when the locust plague is severe, Uruguay is a wheat-exporting country. Flax, raised for linseed, is an important export crop. The vine is grown successfully in the northwestern part of the republic.

Navigation on the Uruguay is interrupted by cataracts at Salto, but much of the trade centering at Montevideo is carried on Uruguay river steamers. The chief towns of the interior are also joined by rail with Montevideo (movement 8,000,000 tons), which is connected with the United States and the chief countries of Europe by steamship lines.†

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* The flesh is cut into pieces, salted, and pressed under stones to extract the juices, then hung on wooden railings under the hot sun till it becomes thoroughly dried. Different markets require different qualities; thus the fatter jerked beef is sent to Brazil and the leaner to the West Indies. Jerked beef is the only cheap form of beef that may be kept for a long time in tropical markets without deterioration.

† Though Montevideo is the second largest port of the Rio de la Plata

Most of the imports are food, hardware, machinery, and textiles; seven eighths of the exports are animal products. Though leather and other industries are increasing, most of the manufactures are imported. As agriculture lags far behind the animal industries, the home markets are supplied with large quantities of foreign foodstuffs; but the sales of animal products are so large that the total exports usually exceed the imports. The mineral resources of the north are little utilized; coal from Cardiff is one of the large imports. Duties on imports are very high.

The pampas of Argentina are its greatest source of wealth. These low, grassy, nearly level, treeless plains extend from the Rio de la Plata north to the luxuriant forests of Gran Chaco, west to the foothills of the Cordilleras at San Juan and Mendoza, and south through Patagonia; their monotony is here and there relieved by low mountains or groups of hills, but in most parts the pampas stretch away apparently as level as the sea. The rivers of the north, the Paraguay, Parana, Uruguay, and Pilcomayo, which reach the sea through the La Plata, and the smaller rivers of the south, have for ages been bringing earth from the mountains to build up these plains. The part of the pampas nearest to the Uruguay and Parana rivers between Buenos Aires and the 30th parallel, and extending to the vicinity of Mercedes and Cordoba in the west, is the great zone of agriculture, where pastures have been largely turned into farmlands and great crops of wheat, flax, and maize are raised. Although the plow is still encroaching upon the grass lands, they continue to make the largest contribution to the wealth of the country, about 29,000,000 cattle and 75,000,000 sheep feeding on the rich natural grasses.

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countries, the harbor is shallow, and freight is carried between the shore and the shipping on lighters. Maldonado is a small port. San José is the largest interior town, all the country settlements being centers of the cattle and sheep trade.

The northern part of the republic is hot, the southern part is frigid, but the central portion where flocks, herds, and farms abound, has a temperate climate. The rainfall is small, but usually sufficient in the growing season.

Animal industries are most important. Argentina is one of the largest sources of export wool, the clip amounting to over 400,000,000 pounds a year (Fig. 54). Buenos Aires is in the great wool market. When shearing time comes there are scarcely cars enough to move the wool crop to that port. The wool is sent to Europe unwashed, the owners asserting that it crosses the ocean better in that condition. They prefer to sell it at a lower rate and allow European buyers to scour it.* Two thirds of the crop goes to France, Belgium, and Germany. Both wool and mutton are being improved by the introduction of superior European breeds. Four fifths of the sheep graze on the pampas of Buenos Aires province. Patagonia raises many sheep and cattle.

Argentina is a great center of the frozen-meat trade. Sheep and cattle were formerly raised almost entirely for wool, hides, and tallow. The meat was thrown away.† It was not till 1882 that great factories were built for freezing mutton and beef so that it might be carried across the tropics to the European markets. Frozen mutton is by far the largest branch of the meat industry. About 200,000 dressed sheep are exported every month in refrigerated chambers.‡ The largest frozen-meat plant in the world is at Buenos Aires.

Frozen beef is a much smaller branch of the industry. Jerked beef is produced on a large scale in the factories,

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* In Australia, on the other hand, wool is scoured in large establishments at Sydney and other places of shipment.

† A large amount of meat is still thrown away, the republic producing about 750,000 tons of meat a year more than it can consume.

‡ Sheep cost about $2 apiece, weigh dressed from thirty pounds (lamb) to seventy pounds (mutton), and cost 1 to 2 cents a pound freightage to London, where the retail price is ten or more cents a pound.

most of which are situated on the banks of the La Plata and the Paraguay, Parana, and Uruguay rivers. Vessels load with jerked beef at the wharves of the factories and take it direct to Brazil, Cuba, and local distributing points.

Live-stock exports are increasing. Exports of live cattle were a failure till the native breeds had been much improved by foreign admixture. Cattle and sheep are transferred from large yards at Buenos Aires to steamships, where they are placed in open pens on deck, the weather being too hot across the tropics to confine them in closed pens. About 150,000 cattle and 500,000 sheep are sent alive to Europe every year. Increased facilities for live shipments (1901) are expected to augment this business. Dairying has been introduced since 1895.

Wheat is the staple of agriculture. It is grown on the pampas mainly north of Buenos Aires and east of Cordoba, where there are many comparatively small farms tilled to a large extent by Italian and German colonists. In 1880 wheat and flour were still imported, but wheat culture has since made long strides, over 5,000,000 acres being devoted to it. Locusts, droughts, and floods are likely to diminish the crop, but as several times the area now in wheat is adapted for it, the republic is destined to be one of the greatest exporting countries. The average distance of wheat haulage to the river ports is not over 150 miles (p. 61). Freight rates to Europe are, however, higher than from this country to Europe.* Argentine wheat is as yet inferior in grading

* Wheat, wool, and cattle freight rates to Europe are affected by the quantities of coal imported into Argentina. As the country exports bulky and heavy articles and imports mainly manufactures, it is difficult for ships from Europe to get full cargoes for Argentina unless the demand for coal there provides abundant freight. When the demand for coal is large, freight rates for Rio Plata products fall; when it is small, rates for Argentine exports advance. Our wool tariff has cut off the former large imports of Argentine wool into this country, while at the same time we are selling larger quantities of manu-

and cleanliness to that of the United States, and therefore brings a smaller price.

Linseed is the next largest agricultural export, going to England, Belgium, and France, flax being grown almost entirely for the seed. Linseed oil is produced by Argentine mills. Maize is a large export to Europe, though much is eaten at home or consumed by the local distilleries. French settlers in San Juan and Mendoza provinces produce wine among the foothills of the Cordilleras, all the product being sold in the country. Special trains are run daily in the season to carrry fresh fruit from Mendoza to the Buenos Aires market.

The timber resources of the Gran Chaco are very large, but are little utilized, for they are far from the transportation routes thus far developed. More Paraguayan or other imported woods are used, but considerable of the home timber, suitable for cabinet work, reaches Buenos Aires, where manufactures of furniture and carriages are large industries. Some woods are sent to Europe, but Argentine timber is so far from tidewater that the cost of freightage is much greater than that of the hardwoods of Central America and parts of Brazil.

Gold, silver, and copper are exported to Germany, England, France, Belgium, and Italy; but, although there are rich mineral resources along the Cordilleras, they have been little developed. Argentina has no coal, unless the discoveries on the Bermejo and in Patagonia are important, which is still doubtful. Large importations are necessary for railroad and manufacturing purposes.

Manufactures are not greatly developed. They pertain most of all to the preparation of meat, hides, and agri-

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factures to that country. Vessels loaded here with merchandise find it difficult to get return cargoes, as we do not want cattle, sheep, wheat, or maize, and buy less wool than formerly; they, therefore, put into Brazil ports for coffee, rubber, and other articles to complete their return cargoes.

cultural products, such as flour and sugar. Since 1890, however, numerous textile mills, aided by a high protective tariff, have been opened, and now supply nearly all the common woolens and cottons. More than 30,000,000 home-made sacks are sold to the farmers every year for sacking their grain. Leather goods made of hides cured in the country are a large product. Structural iron is made, but most machinery is imported. Hats, paper, and beer are also large manufactures. Buenos Aires is the greatest manufacturing and commercial center.*

Textile manufactures are the largest imports. They are chiefly the better grades of cotton goods, followed by wool

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* Buenos Aires, the capital of Argentina and largest city of South America, controls two thirds of the foreign trade, and has magnificent stone docks, the approach to which is poor, owing to the continual deposition of silt in the river bed fronting them. La Plata has a better harbor, and therefore attracts considerable shipping. Rosario, the second largest city, is a river seaport, accessible to vessels drawing 16 feet; it ships a great deal of wheat, meats, and hides direct to foreign countries. Parana is a center of Italian farming communities. The prosperity of Santa Fé, connected by rail with the Parana, is also due to the flourishing agriculture around it by foreign settlers. The building and repairing docks for steamers on the Paraguay and Parana are at Corrientes. Jujuy and Salta, at the northern termini of the railroads, do a large transit trade with Bolivia and Chile by mule and llama trains. Tucuman, in the midst of a large, fertile plain, manufactures a great deal of sugar and rum, and employs several thousand Europeans in its mills. Catamarca and Rioja export oranges and other fruits. San Juan is a center of trade for the mining districts. Mendoza is the chief station on the overland route between Buenos Aires and Chile, and sends all its wine and fruit to Buenos Aires. San Luis is a center of vineyards and orchards nourished by irrigation. Cordoba is the center of a rich farming region made productive by irrigation. Mercedes is surrounded by rich lucerne meadows (alfalfa), a forage plant which is an important export to Brazil. Bahia Blanca has a good harbor, is an outlet for sheep and cattle products, and has direct steamship connections with Europe; the surrounding vineyards produce the excellent Chocoli wine. Rawson is the town of the agricultural Scotch colony on the Chubut river.

and silk fabrics. Next come raw iron for the foundries and machine shops and a large variety of iron and steel manufactures. Crockery, foodstuffs, beverages, and lumber are also very large imports. Most of the hardware and machinery comes from the United States.

Wool, meats, live stock, and hides are half the total exports. Wheat, maize, and timber comprise most of the remaining sales abroad. The leading exports to the United States are wool, hides, and skins.

Railroads extend in all directions from Buenos Aires and have been most important in developing the country. The flat pampas are very favorable for railroad building. The map indicates the railroad at last opened in 1910 across the continent from Buenos Aires to Valparaiso. This line and that to Jujuy are the longest and most important railroads. Buenos Aires is connected by steamships with many important ports of Europe and America.

Business pursuits in Chile are sharply differentiated by varieties of climate. The southeast trade winds blowing off the west and leeward coast of South America (Fig. 8) leave the narrow coast strip practically rainless from southern Ecuador to middle Chile (Fig. 3). North Chile thus has little rain, and agriculture is possible only where streams from the mountains permit irrigation. The great resource of the north being minerals, mining is almost the sole industry. Between Santiago and Valdivia the winds often blow from the sea, bringing sufficient rain for tillage, though irrigation is necessary in many places. The middle zone is thus a region of cattle, wheat, and fruit. Enormous quantities of food are sent from this favored region to the barren north, where thousands of men are working in the nitrate fields and mining camps; thus climate has a great influence upon trade movement from one part of Chile to another. South of Valdivia the westerly winds or "Roaring Forties" (Fig. 8) bring excessive rainfall, favorable to forest growth, and here lumbering and fishing are the main occupations.

Nitrate of soda is the largest resource.* It is obtained along the north coast of Chile, some distance inland. As found, it has the appearance of rock salt; it is crushed and treated at the mines to exclude foreign substances, and carried from the diggings on short railroads to the nitrate ports. It is widely spread on the fields of Germany and France, is used to a lesser extent in Great Britain and Belgium, and about one tenth of the output is sold in this country. Nitrate, exported from Chile for seventy years, is now in larger demand than ever, and comprises three fifths of the total exports, over 1,800,000 tons a year being sold. If north Chile had abundant rainfall this valuable resource would probably have been dissipated and agriculture would have taken its place.

Copper (Fig. 67) is the largest metal export, followed by silver and gold. A great deal of copper ore is smelted in the country. The mining industries are mainly in the north, except coal, of which there is a large field along the southern coast, the Arauco railroad supplying transportation. It is of rather inferior quality, and though exported to other Pacific coast states, a much larger quantity is imported.

Wheat is the leading agricultural product. In early years Chile supplied California and Australia with wheat, and it still has a considerable quantity to sell to Peru and Ecuador. All the cereals of the temperate zone are raised on the rich central plain, besides tobacco, apples and other fruits, and walnuts. Wine is an important product of the south, particularly in the district around Concepcion, some being exported. Two native woods and Oregon pine supply the demand for lumber.

Manufactures have considerable development. Industries

*Cubic niter or Chile saltpeter is known in commerce simply as nitrate. It is used in the manufacture of chemicals, but is far more extensively utilized as a fertilizer, being exported to Europe in enormous quantities to be sold to the farmers.

are most important in the Department of Valparaiso, where there were, in 1899, 457 factories and mills employing 15,000 hands. They include gas works, sugar refineries, wagon works, tanneries, and breweries, using imported machinery, or that made in the country from imported iron. Locomotives, boilers, structural iron, and railroad cars are among the products of the country. Iron mines exist, but are not developed, the coal not being of coking quality. Textiles are large imports. The British, German, Swiss, and other immigrants have had a stimulating effect upon the growth of industries.*

The second South American railroad was built in Chile. There being little interior navigation, railroads are of great importance. The state line from Valparaiso to Concepcion is the principal road; others extend from the ports to the mining or agricultural regions. The fertile plain is covered with a network of passable highways. Steamers ply in the coast trade; Valparaiso † has regular steamship connections with Panama, Liverpool, and Hamburg.

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* The people, isolated by their mountains and the sea, are conservative and not very progressive. Their resources are largely undeveloped. Foreign capital works their nitrate beds and builds their railroads.

† Valparaiso is the most important port on the Pacific coast of South America. It receives nine tenths of the Chilean imports and sends out a third of the exports. Santiago, the capital, is in the garden region of the country, on the edge of a fertile plain irrigated by canals from the Maipo River. Talca, finely situated in a fertile plain, is a trade center connecting with the port of Constitucion, which has some foreign commerce. Chillan is a large cattle market. Tome is the best harbor in the Bay of Concepcion. Concepcion is the trading center for all the region as far south as the Imperial River. Its port is Talcahuano, which has a dry dock. The Biobio is the largest river in Chile, and is navigable for some distance. Arauco and Lebu are ports for coal shipments. Valdivia, exporting hides, lumber, cattle, and lager beer, has been developed largely through the enterprise of the German colonists in South Chile. Puerto Montt, at the south end of the great central plain of Chile, is another German center. North of Valparaiso, La Serena exports copper through the port of Coquimbo.

The largest imports are textiles, sugar, coal, cattle, iron, and tea. The largest exports are nitrate, copper, silver, wheat, iodine, and sole leather. Trade with the United States is by way of the Isthmus of Panama or Magellan Straits.

STATISTICS FOR PARAGUAY, URUGUAY, ARGENTINA, AND CHILE

Paraguay

Annual Trade (in Million Dollars)

	1896.	1898.	1900.	1907.
Imports	2.5	2.6	1.8	3.9
Exports	2.3	2.4	2.1	3.7

Population (1908), 631,000.

Uruguay

Average Annual Trade (in Million Dollars)

	1892–'96.	1897.	1901.	1908.
Imports	22.0	21.2	24.5	34.6
Exports	30.0	31.7	28.7	37.3

Exports to Leading Countries, 1908 (in Million Dollars)

France.	Belgium.	England.	Germany.	United States.
6.4	5.5	3.0	4.6	1.6

Imports from Leading Countries, 1908 (in Million Dollars)

England.	France.	Germany.	Italy.	Brazil.	United States.	Belgium.
9.7	4.0	5.3	2.7	1.8	3.3	1.9

Population (1908), 1,043,000.

Caldera is the port of the mining town of Copiapo; the railroad connecting them is the oldest on the Pacific coast. Taltal, the most southern of the nitrate ports, is connected by rail with the diggings nearest to it. Antofagasta is the largest center of the silver trade and the outlet for most of Bolivia's wool and metals brought to the sea by rail. Arica was formerly the port of Bolivia, and still commands a part of its trade. Iquique, the largest of the nitrate ports, brings its drinking water by an aqueduct from the Andes. Its nitrate exports in 1905 were 1,902,000 tons. On the Strait of Magellan is Punta Arenas, a calling station for all vessels passing through the Straits.

Argentina

Average Annual Trade (in Million Dollars)

	1881–'85.	1891–'95.	1900.	1901.	1902.	1908.
Imports	76.5	99.0	113.4	110.0	99.4	263.4
Exports	66.0	107.5	154.6	161.8	173.2	353.2

Exports to Leading Countries, 1908 (in Million Dollars)

England.	Germany.	France.	Belgium.	United States.	Brazil.	Italy.
78.3	34.7	28.9	35.7	13.0	15.0	7.9

Imports from Leading Countries, 1908 (in Million Dollars)

England.	Germany.	Italy.	United States.	France.	Belgium.	Brazil.
93.3	67.8	24.9	35.5	26.4	12.7	7.2

Population (1908), 6,100,000.

Gold and silver are the monetary standards, with the gold peso (value 96½ cents) as the unit of coinage. Metric weights and measures.

Chile

Average Annual Trade (in Million Dollars)

	1881–'85.	1891–'95.	1899.	1900.	1902.	1908.
Imports	43.8	62.2	38.8*	46.9	48.3	97.6
Exports	53.5	58.0	59.5	61.2	67.8	116.5

Imports from United States (1908), $8,901,000; exports to, $16,083,000.

Population (1898), 3,254,000. Metric weights and measures, but the Spanish standards are still used to some extent.

NOTE

Progress is greater in Argentina than in any other country of South America. It can almost be predicted that this country will become to South America what the United States is to North America. The agricultural possibilities are enormous.

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* Diminution of imports due to partial failure of the grain crop, reducing the purchasing power, and to currency fluctuations, discouraging imports (p. 35).

CHAPTER XXXV

COLOMBIA, ECUADOR, PERU, AND BOLIVIA

The fertile lands of Colombia would support twenty times as many people as live on them. The volume of commerce is small in comparison with the natural wealth, and trade is difficult from lack of good interior communications. Most of the people live in the highlands, though more than half of Colombia is uninhabited (Fig. 32). The climate, determining the distribution of population, is similar to that of Venezuela—hot and malarious in the coast lowlands, cooler and healthful in the highlands. Most of the coastal population live at the seaports.

The differing surface features give variety to the products (Fig. 138). In the north are plains, giving good pasturage for cattle, while large coffee plantations cover the hill slopes of Santander. Among the parallel Andes ranges are high plains where wheat, tobacco, and other crops are grown. East of the mountains in the north are selvas or forests where rubber abounds. South of the selvas extend the open prairie lands of the llanos, where many cattle feed on the rich herbage. South of the llanos is another region of selvas and rubber. The Isthmus of Panama is of little value to Colombia's commerce. Its railroad, owned by foreigners, is merely a means of transport for the commerce (duty free) of other nations.

There are three natural means of penetration. The Atrato River is navigable almost to its source near Lloro, but its low valley is insalubrious, and settlements are few. The Cauca is navigable in its lower part, and the whole val-

COLOMBIA, ECUADOR AND PERU.

FIG. 138.

ley is a highway frequented by mule trains; it is one of the most populous regions. The Magdalena, into which the Cauca empties, is navigable with difficulty for 600 miles to a little below Honda, and is the route to Bogota, the capital.* The journey from Barranquilla to Bogota requires twelve or fourteen days. All the highland plains are reached from the Cauca valley or the Magdalena only by tedious and expensive journeys on the mule paths. Freight must be specially packed for mule carriage.

Agriculture yields little but coffee and tobacco for export. Most farm products are raised for home consumption. Fine wheat grows on the mountain plains, but it is cheaper to import flour for the coast population than to carry wheat to the coast. Coffee, the staple export, is shipped by the Magdalena to Barranquilla or eastward from Santander to Maracaibo; most of it is sent to Europe. Sugar and rum, from sugar cane, and tobacco supply the local demand; tobacco is grown in the interior, but being very valuable in proportion to weight, it can bear the cost of transportation, and thus is an export article; cacao, being raised near the sea, is easily sent to the ports.

Hides and cattle are considerable exports. The llanos might easily become one of the greatest sources of leather; some jerked beef is prepared, and many towns are supplied with fresh beef from the herds on the high plains. Sheep are raised for mutton and wool.

Rubber is the most important forest product. It is mainly gathered in the southern forests; the increased price is stimulating the industry. Ivory nuts, copaiba, balsam of tolu, and dyewoods are also exported.†

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* A railroad is projected and partly built to connect Honda with Bogota. Meanwhile the cost of freightage between the two towns is about $5 a mule load (250 pounds).

† The ivory nut (vegetable ivory) is the seed of a tropical American palm, very hard and white, resembling ivory and used as a substitute for it. Copaiba and tolu are balsams used in medical practice.

Silver, gold, and minerals are exported. All the mountain provinces are rich in minerals, and are said to have yielded $300,000,000 in precious metals during the Spanish occupancy; but mining has greatly declined in recent years. The emerald mines of Muzo, 75 miles from Bogota, have supplied stones for all the world's markets.* Pearls are obtained in Panama Bay.

Manufactures are little developed. The abundance of iron and coal in the south has led to the manufacture of pig and wrought iron, rails, and other articles at Bogota for local use. Other industries in the larger towns include soap and candles, straw hats, tobacco products, tanneries, shoe factories, breweries, and distilleries. Most of the sole leather is made at Barranquilla † and turned into boots and shoes, but the imports from Europe are large. Many other articles, more or less crude, are made for home use.

The principal imports are foodstuffs, textiles, and iron and steel goods. Though the population is a third larger than

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* Emerald mining was entirely suspended during the latest revolution (1900).

† Barranquilla, having the best port on the coast (Sabanilla) and on the navigable Magdalena, is naturally the leading commercial town, commanding the larger part of the sea trade; large vessels can not enter the Magdalena, and freight is transferred to and from Sabanilla by lighters. Cartagena, once the leading port, has declined owing to the silting of its harbor. Colon and Panama are merely way stations for the traffic across the isthmus. Buenaventura, the only important harbor, except Panama, on the Pacific coast, is a gateway for the agricultural communities of the upper Cauca valley. Bogota, the most beautiful city of South America, stands at an elevation of over 8,000 feet above the sea, in the midst of a great, fertile plain, which made this large, isolated city possible. Medellin, the second largest city, is in a fertile valley, where large crops and many cattle are raised, and is a center of gold mining. Sonson has rich pastures and is an important trade center. In favorable seasons steamers can ascend the Orinoco and Meta rivers from the Atlantic to Cabugaro, 160 miles from Bogota. The gold, tobacco, and cacao exports of Bucaramanga gave it importance, but these industries have declined.

that of Venezuela the imports are much smaller; it is so difficult for the people in the highlands, without good communications, to establish trade relations with foreign countries that they do without many articles that Venezuela buys. The exports, coffee, hides, gold, silver, tobacco, and other articles, are those that can best be delivered at the ports, or whose value makes it profitable to do so in spite of costly carriage. The United States receives a fourth of the exports and sends a fourth of the imports. The republic has steamship connections with the United States, England, Germany, and France, British vessels carrying more than half the trade.

Ecuador has many of the vegetable products of all latitudes (p. 6). The western lowlands have tropical forests, a large variety of useful tropical plants, and light, thin-walled houses. On the central highlands are villages of stone and adobe surrounded by fields of wheat, barley, potatoes, and lucerne, above which tower the snow-capped peaks of the Andes. The eastern lowlands are a region of forests, with resources in rubber and gold. The country is thus able to produce many commodities that the world buys, but very few of them are sent to foreign markets. The roads in the interior are merely mule tracks. No wheat is brought down to the coast towns, which depend upon foreign flour for their bread. The region east of the Gulf of Guayaquil and the basin of the Rio Guayas, north of the gulf, are the best tilled and most fertile districts.

Ecuador is a very large source of cacao (p. 72). It is the principal wealth of the country. The plantations send the product to Guayaquil by river steamboat or railroad, most of it being exported, though considerable is consumed in the local chocolate factories. Cacao is three fourths or more of the total exports.*

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* Coffee is of superior quality, and is second in importance among the exports. The sugar, manufactured from sugar cane, tobacco,

MINING INDUSTRIES.

HYDRAULIC GOLD MINING.

Animal raising is largely confined to cattle to supply the home demand for beef. Hides are sent chiefly to the United States. The high price of rubber, the most important among the forest products, is stimulating collectors to work this new field. Much vegetable ivory is obtained nearer the sea.

Little attention is paid to the mineral industries, though gold is washed from the gravel in the extreme north and extracted from the ore at Zaruma in the southwest. The copper and petroleum resources have not been developed.

The making of so-called Panama hats is the industry best known in other lands. These hats, which derive their name merely from the fact that they are forwarded through Panama, are made by coast Indians from the fine straw of the toquilla. Many qualities are produced, the best hats bringing very high prices.*

Most of the other industries are at Guayaquil.† As there are few manufactures, except the products of a small number of woolen and cotton mills, saw mills, chocolate works, soap factories, and breweries, the imports are mainly manufactures and foodstuffs.

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fruits, and other agricultural products are nearly all consumed at home.

* The hats are plaited while the air is humid, between midnight and 7 A. M. The straw is carefully selected and divided into the requisite widths with the thumb nail. The plaiting begins at the apex of the crown and continues in circular form till the hat is finished. The work requires patience, fine sight, and special skill. Efforts to induce the Indians to make forms popular in foreign markets have not succeeded. Indians in north Peru and in Colombia also make hats of Ecuadorian straw and of the desired forms.

† Guayaquil has the best harbor on the west coast of South America and handles nearly all the foreign trade of Ecuador; the only railroad extends from Guayaquil to the summit of the Andes plateau. Manta is one of a number of small harbors that export the products of the surrounding districts. Esmeraldas is the port nearest to Quito, but, as its entrance is obstructed by a bar, the capital city depends upon Guayaquil. Quito has little industrial or commercial importance.

One third of the exports go to France. That country and Spain are the largest purchasers of cacao, France consuming enormous quantities of chocolate, and Spain esteeming cocoa as second only to wine as a beverage. The United States and England each buy about an eighth of the exports. San Francisco and New York import large quantities of cacao, both for chocolate and cocoa. The United States contributes about a fourth of the imports, flour, lard, kerosene, lumber, and machinery being the chief items. Cotton and woolen textiles are the largest imports from Europe.

Sugar and metals are the most important exports of Peru. The long, narrow strip between the mountains and the sea is a desert whose monotony is relieved only by the irrigated farms and plantations in the river valleys. The streams, fed by the melting snow of the Andes, flow west to the ocean, imparting life to their valleys, which are covered with sugar cane, cotton, and tobacco plantations. Behind the desert intersected by these zones of vegetation rise the barren heights of the Cordilleras, whose economic importance is due to their vast stores of mineral wealth and the streams they send through the desert. On the east side of the mountains, sloping to the head streams of the Amazon, are dense forests, rich in rubber and cinchona;* and fertile lowlands adapted for most cultural plants of the tropics.

Sugar cane and cotton are the agricultural specialties. Sugar is usually the largest export. Cane is grown in valleys along the entire coast. The fields being cheaply irrigated, and the absence of rain permitting grinding for

* Quinine, used for malarial diseases, is obtained from the bark of various trees of the genus cinchona. These trees, though native in South America, have been introduced into Java, India, and other tropical lands, from which large quantities of quinine are now obtained. The bark is known in commerce as Peruvian bark, most of the South American product coming from Peru and Bolivia.

nine months in the year, sugar is produced at small cost. Five sixths of the crop is exported, Great Britain, the United States, and Chile being the largest buyers. Cotton, grown in north Peru, is next in importance. It is a long, staple fiber,* used in several foreign countries to mix with wool used in underwear and hosiery, the resulting fabrics being more durable and shrinking less. Coffee is also important, but the plantations being on the Andes slopes, a week's journey by mule train from railroads, the industry is not expanding. As the cereals do not meet the demand, breadstuffs are largely imported. Coca leaves † and cocaine are sent to many countries.

Cattle are bred for beef and hides which are mostly used in native leather work; our country takes about one fourth of the surplus hides. Llamas and alpacas are valuable as beasts of burden and for their wool; although, as the alpaca can be sheared only once in two years, the returns are not large. Iquitos, ‡ which has direct steamship communication with England, is the center of the rubber industry.

Minerals are among the largest exports. Silver mines are worked in many parts of Peru, the most important center being Cerro Pasco, north of the Oroya Railroad. Here also are immense copper deposits, from which Peru has recently begun to ship a great deal of ore. The industry is restricted by the necessity of carrying the ore 65 miles on the backs of llamas or mules to the railroad. #

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* The mean length of the best known cotton fibers is: Sea Island, 1.61 inches; Egyptian, 1.41; Peruvian, 1.3; Brazilian, 1.17; American Upland, 1.02; India, 0.89.

† Coca must not be confounded with cacao. The powerful drug cocaine is obtained from the leaves of the cultivated South American shrub, coca; the leaves are chewed by the Indians with effects like those of opium.

‡ Iquitos has been brought within twenty days of Lima by a good road from the terminus of the Oroya R. R. to Puerto Bermudez, whence steam launches descend to Iquitos.

It is evident that now the extension of the railroad to Cerro

Gold mining is difficult, and the output is small. Petroleum, obtained in the north, near Payta, is used as fuel in factories and refined for domestic use. Its quality is not equal to the imported American kerosene, though the Peruvian oil is cheaper.

A few cotton and woolen mills at Lima, Arequipa, and other towns consume part of the raw cotton and wool and have diminished the imports of the coarser fabrics. Callao has match, soap, and candle factories, and Lima makes beer and artificial ice; boot-making is an industry in many towns. The "Panama hats" made by Indians near Payta and Piura are exported to the value of about $50,000 a year. With manufacturing industries so little developed the imports of textiles, hardware, and machinery are naturally large.*

More than one third of the imports are bought in England. The largest imports are cotton and woolen goods, iron and its manufactures, and machinery. Grocery supplies are also a large item. Wheat is imported from Chile and the United States. We also sell to Peru lumber, railroad ties, agricultural and mining machinery, and a variety of other articles. About half the exports go to England; more

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Pasco is completed, copper mining will have much greater development. As both silver and copper ores are smelted, much silver and copper, as well as their ores, are exported.

* Fig. 138 shows the ports, most of them small, through which the coasting business and the foreign trade of the republic is transacted. Most of them are connected by rail with the capitals of the provinces in which they are situated. The longest railroad lines are those from Chimbote to the mining regions in the heart of the Cordilleras, from Callao through Lima to the eastern slope of the mountains—one of the greatest achievements of railroad construction, and from Mollendo to Lake Titicaca, and the city of La Paz, giving Bolivia an outlet through Peru. Puno, the port on Lake Titicaca, is one of the largest centers of silver mining. Most of the foreign trade is through the port of Callao (Fig. 15). Lima, the capital, is built of adobe or sun-dried bricks.

than half of our large purchases from Peru are sugar, cotton, and goatskins.

Bolivia is a great producer of silver, tin, and copper. These metals are the largest part of the exports. The western plateau, which, surmounted by Cordilleran ranges, is cold and healthful, contains most of this mineral wealth. Deep valleys, some thousands of feet below the general level, permit the cultivation of the cereals and other products of the temperate zone in some places, and of semi-tropical products in others (Fig. 139). These valleys supply the foodstuffs, including fruits, required by the inhabitants. The transitions from cold to warm climates, due to differences of altitude on this plateau, are most abrupt.* The lower lands of the north and east are still largely unexplored, but the north is rich in rubber and the east in pasturage.

Silver is the most abundant metal (Fig. 70). The ores in most of the mines are extremely rich. The output, however, has recently fallen off on account of civil war and the partial flooding of the Huanchaca mines with hot water. Tin is found associated with silver in many places, and is the second largest export (Fig. 66). About 3,000 tons of copper are shipped to Europe every year, mostly from Mollendo.†

With no seacoasts, Bolivia must send all exports through foreign lands. Many of the ores and metals are carried by mule or llama trains long distances to railroads, whose freights are very high. When the shipments reach the sea they are still many thousands of miles from markets; few products less valuable than silver, tin, and copper could

* A gentleman in La Paz may send a servant in the morning to the heights above to bring down a load of ice for the household, and another to the lower levels for pineapples and other tropical fruits; both will return at noon with their commodities.

† Very little gold is mined. Bismuth, antimony, and borax are in large supply, but scarcely figure in the exports.

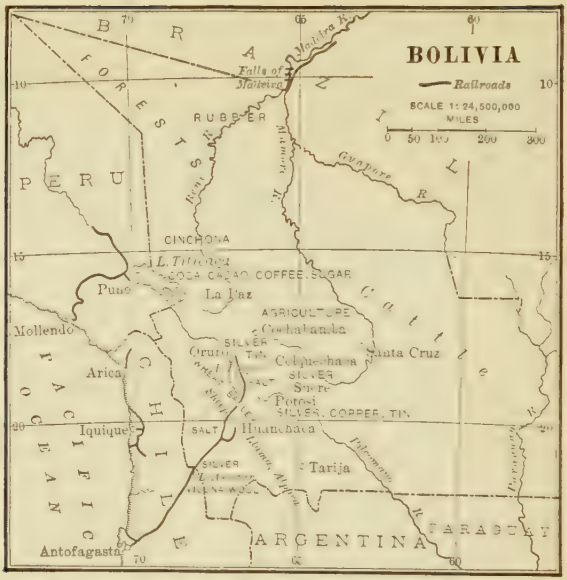

FIG. 139.—Observe the two outlets for Bolivia's products by rail (1) from Puno to Mollendo through Peru, and (2) from Oruro to Antofagasta through Chile; the third outlet is by pack trail to Jujuy, connecting there with the Argentine railroads (Fig. 137). At Lake Ascotan large borax works are operated. In this region the vicuña, a wild, active animal of the Andes, is hunted for its wool, which is more valuable than that of the alpaca. Mining is confined to the mountainous part of the country. Indians carry great quantities of salt to the mining centers for the reduction of ores. The Huanchaca silver mines, the richest in Bolivia, supplied the money to build the costly railroad to Antofagasta. The country is well populated between Huanchaca and Oruro, and the valley farm lands are well tilled. Oruro, Colquechaca, and Potosi are the centers of the greatest number of mines, Oruro being most important since the railroad reached it. Sucre, at the foot of the mountains, is a center for the cereals and other products of the temperate zone. La Paz is a very busy commercial center. North of it are fertile valleys supplying tropical products. Still farther north is the forest and rubber region of the Beni River in the Amazon basin. In the eastern lowlands of Santa Cruz province are vast estates and numerous cattle, which are almost valueless for lack of transportation. East of Oruro is the rich agricultural district of Cochabamba, lower lying and genial in climate. Tarija, in the south, is famous for its fertile soil and large crops.

bear the high tax of such expensive transportation. The cost of marketing metals is, in fact, retarding the development of Bolivian mining industries.

Rubber follows the metals in export importance. The shipments from the Beni region are estimated at 800 tons a year. A great deal of Bolivian rubber, however, is sent down the rivers to Para and classed as Brazilian rubber. A road has been built around the cataracts of the Madeira to facilitate carriage to the Atlantic.

Agricultural products supply only home needs. A little coffee, cacao, and coca are sent to Chile, but the maize, wheat, barley, and other temperate or subtropical crops are barely sufficient for the local demand. Beef is largely consumed, but many cattle are imported from Argentina.

Bolivia does not figure directly as an importing and exporting country because it carries on all its foreign trade through Chile, Peru, Argentina, and Brazil. Statistics of the trade are only approximate. As the country is almost destitute of manufactures, ready-made clothing, cotton and woolen fabrics, and hardware are the leading imports. Our trade returns show almost no business with Bolivia, though, in fact, a considerable quantity of our commodities going to that country are classed as Chilean because consigned to a Chilean port. England and Germany have the larger part of the trade, and supply most of the capital and management for the mining and other enterprises.

STATISTICS FOR COLOMBIA, ECUADOR, PERU, BOLIVIA

COLOMBIA

Average Annual Trade (in Million Dollars)

	1891–'95.	1898.	1908.
Imports	12.5	11.0	13.5
Exports	17.0	19.2	14.9

Population, 4,320,000.

ECUADOR

Annual Trade (in Million Dollars, estimated)

	1902.	1908.
Imports	7.0	10.0
Exports	8.8	12.9

Population (estimated), 1,400,000.

PERU

Annual Trade (in Million Dollars) *

	1898.	1899.	1902.	1908.
Imports	8.1	8.2	21.0	25.7
Exports	12.7	13.5	17.9	26.1

Population (1896), 4,559,550 (no later data).

BOLIVIA

Annual Trade (in Million Dollars, estimated)

	1902.	1908.
Imports	5.6	20.8
Exports	11.1	24.0

Population (1908), 1,954,000.

* These figures do not include Iquitos, which does over $2,000,000 foreign business a year through the Amazon.

CHAPTER XXXVI

THE WEST INDIES AND BERMUDA

The largest trade interests of the West Indies are with the United States. It is the nearest and best market for the sugar, tobacco, cacao, and fruits, which are their chief products. It is also the nearest and best source of supply for the flour and provisions which they must import. Nearly all the islands, even the smaller ones, have the advantage of regular and frequent steamship communications with the United States and Europe. While their commercial interests are closely identified with the United States, they are all politically attached to European countries, except Porto Rico (pp. 168–170), Cuba (pp. 177–181), and the negro republics, Santo Domingo and Haiti. The soil of the Bahamas is not rich, but in the other islands it is extremely fertile, producing a large variety of tropical products. The greatest disadvantage is the hurricanes, occurring usually in August or the fall months, which sometimes destroy much property. The decline in the price of cane sugar, in recent years, has depressed industry and trade to a deplorable extent.

Coffee is the chief product of the republic of Haiti.* It is particularly esteemed in France, which takes two thirds of the exports, very little coming to our market, as Brazilian coffee is cheaper and gives larger profit to importers. The

* The republic occupies the western third of the island of Haiti, which is nearly as large as South Carolina. The republic of Santo Domingo occupies the eastern two thirds. The inhabitants of Haiti are French-speaking negroes, while the negroes and half-breeds of Santo Domingo speak Spanish.

plantations on the mountain slopes produce so much coffee that the republic is sometimes next to the leading coffee countries in exports. Logwood and cacao are other important sales abroad, most of the exports going to France, Germany, and England. The United States supplies more than half of the imports, and monopolizes the trade in breadstuffs, kerosene, and coarse cotton textiles. The country has very little development, even the coffee and cacao being left to nature after planting. The inland communications are so poor that many of the people prefer to go from one to another of the ports on the slow and uncomfortable coasting schooners. Port au Prince nearly monopolizes the foreign trade, Cape Haitien and Aux Cayes also having some importance.

Sugar, tobacco, and cacao are the leading industries and exports of Santo Domingo. Much divi-divi * is also exported. Nearly all the exports come to the United States, which supplies more than half of the imports. Santo Domingo, the capital, on the south coast, and the still more important Puerto Plata on the north coast, are the chief ports.

The British West Indies commercially far surpass the other European colonies. The Bahamas (Fig. 20) are the most northern; their mild and agreeable climate makes Nassau, the largest town, a winter health resort. The United States has four fifths of the total trade, as the proximity of the islands, three steamers a month from New York and cheap freight rates, favor the closest trade relations. The main support of the islands is collecting and shipping sponges (p. 88),† a business that brings to the islands over $500,000 a year. The fruit trade is the next largest source of income, millions of pineapples and oranges, besides guavas, mangoes, and grape-fruit, being exported

* Divi-divi, a tropical American shrub valued for its pods, containing tannin and gallic acid, is used to tan leather and dye cloth.

† In August, 1899, several hundred of the sponge fishermen were drowned by the sinking of their vessels in a severe hurricane.

to this country. The cultivation of henequen is also a growing industry. The largest imports, in order of importance, are textiles, flour, canned goods, hardware, fresh and salt meats, lumber, sugar, and rice.

Nearly half of the exports of Jamaica (Fig. 20) are fruit, chiefly bananas, most of which are owned and transported by an American company that has large similar interests in some of the other islands. Sugar, rum, coffee, pimento, and Jamaica ginger * are other important exports. Cotton goods, codfish, flour, and rice are the largest imports. More than half the total trade is with the United States, even the imports from this country being larger than from England.

The other British islands and the possessions of France, Denmark, and the Netherlands are in the Lesser Antilles, the island chain that develops a graceful curve between Porto Rico and South America. The outlying island of Barbados is the most important of the minor British possessions. It is the largest sugar producer in the British West Indies. Nearly every available acre is in sugar,† with the result that the home-grown food supply, mostly sweet potatoes and yams, is not sufficient to feed one tenth of the dense population. Famine would ensue if food imports were discontinued for a month. The United States supplies all the food, except the little that Canada sends. Nearly everything that Barbados buys, except clothing, boots, and hats, comes from this country. The famous Muscovado (unrefined cane sugar) of Barbados is sent to the United States, which buys three fourths of it, and to

* Pimento is the berry of an evergreen tree, more commonly called allspice or Jamaica pepper, used as a spice in cookery. The best Jamaica ginger has the reputation of being unequaled. Its cultivation, however, is decreasing, as it is a very exhausting crop.

† The sugar factories, run by windmills, come to a stop if the wind is in any direction except from the northeast, for the mills are fixed to catch only the trade wind.

other British colonies, though it is being shut out from Great Britain by beet sugar. The harbor of Bridgetown, the port, is merely an open roadstead.

Trinidad (Fig. 135), near the coast of Venezuela, is, next to Jamaica, the largest of the British West Indies. Sugar is its largest crop, though cacao is nearly as important. The distinctive product is asphalt * from the Brea or Pitch Lake. Sugar, cacao, and molasses are the chief exports. As the island does not produce all the food it needs, flour, plantains from Venezuela, and other foodstuffs, as well as textiles, spirits, and machinery, are large imports. The neighboring island of Tobago exports cotton, rum, cocoanuts, and tobacco.†

The few small islands included in the French, Danish, and Dutch possessions have little trade except with the mother countries.

Bermuda's chief commercial relations are with the United States. This group (Fig. 20), the most northern coral islands in the world, has an area of only nineteen and one half square miles. There are no manufactures or railroads, and the sole industry is agriculture; trade is restricted to

* The pitch lake of Trinidad is the most notable source of asphalt, which is used in several countries in street pavements, in roofing materials, and for other purposes. Over 100,000 tons a year are imported into the United States by the American company that leases the lake. The removal of this amount is equivalent to lowering the surface of the lake about six inches, the material taken away being replaced by semiliquid pitch forced to the surface through many blowholes. The pitch, broken up for shipment into pieces weighing twenty to thirty pounds, is carried on cars and dumped directly into the hold of the vessels which bring it to this country.

† The British West Indies also include quite a number of islands in the Leeward and Windward islands, whose total trade is not more than half that of Barbados. They have suffered severely from the decline in the price of sugar. Some islands, exporting arrowroot as well as sugar, have thrived no better, as the markets have been overstocked with arrowroot, which is the starch from a tropical root esteemed as food for infants and invalids.

the needs of about 20,000 inhabitants and 2,000 tourists, still the foreign commerce is about $2,500,000 a year. The United States takes practically all the exports, three fifths of which consists of onions, one fifth of potatoes, and most of the remainder of lily bulbs. Onions and lilies are often grown side by side in alternate patches. Bermuda's advantage in onion and potato exports is that they reach our markets before our own crops come in, the earliest onions being ready for market before the end of the year. Two crops of potatoes are grown in the year, one harvested about Christmas and the other in March. Lily blooms are sent to New York as cut flowers for the Easter trade, but the large export is lily bulbs, which, when matured, are shipped to New York, where they are classified according to quality and sold to the hothouse trade to be planted under glass for the Easter market. About three fifths of the imports are derived from this country. As Bermuda has no manufactures and very few animals, it needs large quantities of flour, meats, dairy products, textiles, and hardware. It buys from the United States and other countries over three times as much as it sells to them, much of the money spent in other lands coming back to the islands from the many tourists who go to Bermuda to enjoy the genial winter climate. Hamilton, the political and commercial center, has regular steamship connections with New York. A cable connects the islands with Halifax.

STATISTICS FOR THE WEST INDIES AND BERMUDA

	British West Indies					
	Bahamas.	Jamaica.	Leeward Islands.	Windward Islands.	Barbados.	Trinidad and Tobago.
Population..	60,200	848,000	127,723	180,000	194,477	273,898
Average Annual Imports (in Million Dollars)						
1881–'85.....	1.0	7.5	2.3	2.0	5.4	12.8
1891–'95.....	0.9	10.5	2.2	2.2	5.8	10.9
1908	1.8	12.0	2.8	7.0	6.0	13.0

Average Annual Exports (in Million Dollars)

1881–'85.....	0.7	7.2	2.7	2.5	5.8	12.5
1891–'95.....	0.6	9.5	2.3	2.6	4.6	10.8
1908	0.9	11.2	2.7	6.1	4.4	11.5

Jamaica (fiscal year ending March, 1906), imports, $8,943,527; exports, $8,969,835.

In that year the United States bought 57.4 per cent of Jamaica's exports and sold her 39 per cent of her imports.

BERMUDA

Trade in 1909 (in Million Dollars)

Imports from the U. S.....	1.1	Exports to the U. S.....	0.48

Trade in 1907: Imports, $2,102,980; exports, $702,990. Population (1901), 17,535.

Trade of Haiti and Santo Domingo, 1908 (in Million Dollars)

	Haiti.	Santo Domingo.
Imports.....	4.7	4.9
Exports.....	3.5	9.6

In 1907 the imports of Haiti from the United States were $3,857,000; exports to, $525,947.

In 1909 the imports of Santo Domingo from the United States were $2,502,000; exports to, $3,654,000.

Population: Haiti (1901), 1,294,100; Santo Domingo, 610,000.

CHAPTER XXXVII

RUSSIAN ASIA

Siberia is Russia's reserve for its overflowing population, and a market for its manufactures. Steam communications having been established by railroad and river between St. Petersburg and Vladivostok, immigration has been pouring into Siberia at a rate unparalleled except in the history of the United States. The policy of the Czar's Government is rapidly to develop the whole of habitable Siberia, and to keep out all foreign manufactures that Russian shops and mills can supply.*

The northern third of Siberia is of little value for commerce. The region between the Arctic Ocean and the Polar Circle is a frost-bound waste, covered with arctic mosses and lichens (the tundra, Fig. 4), where nomad hunters and fishermen live, and the ivory of the extinct mammoth is dug from the ice or frozen soil. South of the tundra is a con-

* In the four years ending in 1900 over 700,000 Russian peasants removed mostly to the farming districts of eastern Siberia, being transported on the Siberian Railroad at a merely nominal rate and established on lands allotted to them. The Government abolished the Siberian exile system, building prisons for the confinement of convicts sent to that country, in order that criminals shall not menace the peace and property of honest immigrants. Free trade in Siberia was abandoned in 1900, the heavy duties levied in European Russia being imposed at the Siberian ports and frontiers. The policy was a failure and free trade was reëstablished in 1903. Foreign vessels have been forbidden to engage in trade between ports of the Russian empire, so that all sea commerce between Russian and Siberian ports may be carried in Russian bottoms.

tinuous forest of conifers, extending from the Ob River to far beyond the Lena, yielding lumber and abounding with animals in whose fur there is a large trade (pp. 88, 89).* In southern Siberia (Fig. 140) is the agricultural zone, stretching south to the Chinese frontier. The black-earth region of Russia is continued eastward in the southern part of Tobolsk province and through the middle of Tomsk province, making this portion of Siberia a rich agricultural district, where most of the colonists live. Good farm lands extend beyond the black-earth belt almost to Irkutsk. Domestic animals are raised, and wheat, rye, and oats are large crops in spite of the cold climate. Only a part of this fertile region is as yet under cultivation. The agricultural lands also include the regions watered by the Amur and the Ussuri in the extreme southeast, still sparsely populated, though recent immigration is mostly to that region. Though wheat thrives in the west, it is a poor crop in the wet Amur region.† Cattle for dairy products and beef are most numerous near the large towns.

The mineral resources are very great. Two thirds of Russia's contribution to the gold output (Fig. 68) comes from Siberia, though most of the mining is confined to washing placer gravels, little machinery having been introduced to work the extensive quartz veins. But the development even of gold mining is small in proportion to the resources. The silver output is comparatively small, and little attention is as yet paid to other metals, though they are abun-

* The forests are nearly impenetrable. The most experienced trappers do not venture far into them without marking the trees.

† A great deal of grain from the western wheat lands is taken by boat down the Irtysh and up the Tura to Tiumen, where it is forwarded by rail to Russia. It is also shipped east and west on the Trans-Siberian railroad. Prince Krapotkin and other authoritative writers do not believe that Siberia will ever be a large wheat-exporting country, because the mining regions, the middle Urals, and the Kirghiz Steppe will always depend upon Siberia for wheat, whose area of cultivation is restricted by climatic conditions.

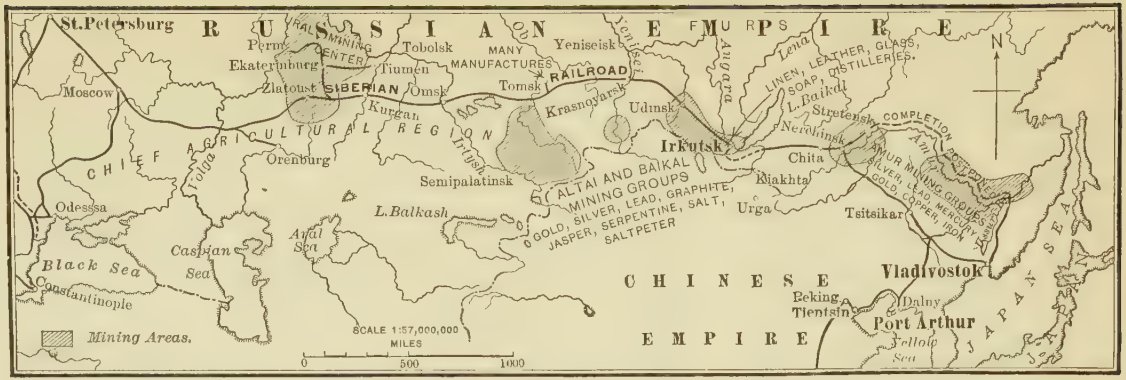

FIG. 140.—This map shows only the agricultural and mining regions of Siberia. The Trans-Siberian railroad turns southeast through Northern Manchuria to Tsitsikar and Vladivostok. The branch line through Manchuria to Dalny and Port Arthur makes the distance by rail between Berlin and Port Arthur about 6,350 miles; trains will ultimately make the journey in fifteen days. The port of Dalny is rapidly developing. Icebreaking steamers keep the port of Vladivostok open in winter. Its trade with America and East Asia is rapidly increasing. The great caravan-trade route from China passes through Urga and Kiakhta to Irkutsk, and mainly follows the Siberian Railroad to Moscow. This trade has employed about 16,000 men and 80,000 horses, moving annually over 65,000 tons of freight, most of it tea from China, worth from $7,000,000 to $8,000,000 a year. Irkutsk is the second largest city, an important trading and industrial center and the leading consumer of luxuries (*articles de Paris*) in Siberia. Nerchinsk is the trading center of one of the largest mining regions. Trade with the gold camps of the Yenisei valley is the main support of Krasnoyarsk; the railroad bridge crossing the Yenisei here is three fifths of a mile in length. Tomsk, though the largest and most industrial city, is not on the main line of the railroad. Krasnoyarsk, Omsk, Tiumen, and Kurgan owe their position and much of their importance to the fact that towns were sure to rise where land-trade routes crossed water routes. Orenburg is now connected with Tashkent by a railroad passing the north coast of Aral Sea.

dant, as well as lignite and coal to a smaller extent. The famous Alibert graphite mines, west of Irkutsk, are owned by a firm of German lead-pencil manufacturers.

The industrial development is small. A large number of men are employed in cutting lumber in the great forests and transporting it by water to the chief towns on the river banks. General manufactures have also been established within a few years, chiefly at Tomsk, which leads in industrial occupations, and at Irkutsk. Most manufactured articles are derived from Russia. It is expected that, with the present rapid increase in population, Siberia will soon produce a larger quantity of the manufactures consumed.

The rivers are very important in transportation. The season of navigation, however, is only about six months. The Ob and Irtysh are navigable almost to their sources, over 100 steamers and hundreds of barges plying on the Ob alone, while the Yenisei, Lena, and many affluents are important highways. Canalized rivers and a canal connect the Ob and Yenisei, north of Tomsk, so that grain and other products of the Yenisei basin are carried by water to the Russian frontier.* The Amur and other rivers of east Siberia have nearly 9,000 miles of navigation, a considerable number of large steamers plying on the Amur.

There are no trade statistics. Most of the business is done with Russia, and a considerable amount with China, though the country is merely a forwarding agent to and from Russia for most of the Chinese trade. Vladivostok has trade relations with west Europe, Japan, Corea, and our Pacific coast, east Siberia buying important quantities of our wheat, flour, building materials, farm implements, and iron and steel and their products. Siberian squirrel

* The possibility of transshipping freight from the mouths of the Ob and Yenisei to steamships from the Atlantic has been demonstrated, but not the commercial practicability of this route through the ice-strewn Arctic Ocean.

and other furs and skins are sent to all the fur markets. Siberia must be regarded as a country of vast resources, whose development on a large scale is only just beginning.

Petroleum is the largest product of Caucasia (Fig. 141).* Nearly the entire population of the region around Baku is engaged in collecting petroleum from deep wells and refining the product (p. 119). Much of the oil is used as fuel in factories, river steamers, and the locomotives of the Trans-Caspian railroad. Kerosene is sent to Batum for shipment to Russian or foreign markets, or shipped on the Caspian and distributed widely through Russia by Volga and other river steamers.

Among the other products of Trans-Caucasia are raw silk, a successful and growing industry, two thirds of the product being sent to the Moscow silk mills and the remainder consumed in the country or exported to Marseilles. A small part of Russia's cotton is grown in Caucasian valleys, and considerable wine is produced on the mountain slopes. Manufactures are unimportant except in Tiflis, the chief commercial center and the largest city in Russian Asia, and Erivan (Fig. 128), which are noted for their textiles, carpets, embroideries, and weapons. The Armenians are the best workmen, excelling particularly in metal work. Batum, the best harbor on the east coast of the Black Sea, exports petroleum, wheat, carpets, raw silk, and cocoons, and makes many thousands of wooden and tin cases in which to ship petroleum, though a great deal of it is forwarded in bulk.

Cotton is the largest export from Russian Central Asia (Fig. 141). This great territory, from the Caspian Sea to India, annexed to Russia by conquest, is largely an arid desert, except in the eastern portion, with beautiful oases interspersed among the wastes of sand where rivers supply

* Russia includes both North and Trans-Caucasia in its Asiatic territory. For the climate of Caucasia, see Fig. 125; agricultural products, Fig. 127.

water for irrigation. It was brought into close commercial relations with Russia only by the building of the Trans-Caspian railroad, which extends from Krasnovodsk on the Caspian to Tashkent, with a southern branch to Kushk.*

Nearly 800,000,000 pounds of clean fiber cotton are now raised in Russian Central Asia every year, the larger portion in Ferghana, much of which is shipped to Russia over the Trans-Caspian Railroad. The larger part of the cotton is grown from the seed of American upland, which thrives in Ferghana and brings a better price than the Asiatic varieties. Khiva and Bokhara supply annually for home and Russian demand about 320,000,000 pounds, the export Khivan cotton, a superior native variety, going by camel caravan to Orenburg; considerable cotton is also grown in the Merv oasis; the Trans-Caucasia cotton fields sometimes yield over 200,000,000 pounds a year. It will probably be long before the Russian mills are wholly supplied with Russian-grown cotton, as the Turkestan cotton area, while increasing, will be limited by the water supply for irrigation. An important part of the crop will always be required for the large local manufacture of cotton fabrics.

Russian Central Asia has exterior trade relations only with Russia, Siberia, Persia, and, to a small extent, with India and Afghanistan, whose merchants bring some British commodities into the markets. It is having remarkable development under the Russian policy of extending railroad lines and irrigation works, which are greatly enlarging the areas of cultivation.

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*The Trans-Caspian railroad was the first experiment in desert railroad building. Water was brought in conduits from the mountains for steam purposes, where rivers did not supply the need. The great difficulty was to fix the drifting sands so that they would not bury the track. The saxaoul shrub, finally planted in millions along the track, now keeps the sand from interfering with traffic, except in some places where board walls are erected or gangs of shovelers are stationed.

FIG. 141.—Krasnovodsk, the Caspian port from which the Trans-Caspian Railroad starts, is connected with Astrakhan at the mouth of the Volga, and with Baku, by lines of steamboats. Askabad, made fertile by streams led from mountains on the Persian frontier, has import and export trade with Persia. The Merv oasis, watered by the Murghab, is very fertile. The plain of Ferghana, nearly surrounded by mountains whose streams are led into irrigation canals, is a blooming garden, the most fertile part of Russian Turkestan. The city of Bokhara, famous as a seat of Mohammedan learning, is surrounded by a fertile district, manufactures fine cotton and silk fabrics and ornamental leather, and is a center for the sale of Russian, Persian, and British products. The waters of the Zerafshan are nearly exhausted in giving fertility to the regions around Bokhara and Samarkand. The Russians have built a new town adjoining the ancient and historic city of Samarkand. Kokan and New Margelan are great centers of cotton and silk culture, and have textile, leather, and other industries. Tashkent, the commercial and political capital of Russian Central Asia, and the second largest city in Russian Asia, at the convergence of ancient caravan routes leading to Russia, is surrounded by irrigated fields growing wheat and other cereals, cotton, and enormous quantities of fruit; it has 156,000 inhabitants, of whom 30,000 are Russians, and is a center of silk, cotton, woolen, and leather industries. Khiva, the great slave market of Central Asia before the Russian invasion, is watered by the Amu Daria (the ancient Oxus), has large herds of camels and flocks of sheep, and exports and manufactures its large cotton crop. Most of the oases raise great numbers of cattle, sheep, horses, and camels. The fishing industry is important along the shores of the Caspian.

CHAPTER XXXVIII

INDIA AND CEYLON

India is a world in itself, half as large as the United States, with no land approach except through difficult mountain passes. It is reached easily only by sea. The great walls of the Himalayas on the north, the Suleiman mountains on the west, and the mountains of Burma on the east shut it off from the rest of Asia; and the long seacoast affords but few good harbors for large vessels. It is therefore fortunate that railroads connect all important points of the interior with the leading ports, so that products have comparatively easy access to the sea routes.

India has two conspicuous surface features: (1) a great low plain at the foot of the Himalayas, extending east and west across the continental portion; and (2) the highlands of Deccan,* covering the peninsula. Both the plain and the highlands, as a rule, have sufficient water for crops, with fertile, alluvial soil in the broad river valleys, and widespread areas of black soil in the highlands, the waste of plutonic rocks, rich in plant food. The density of population is determined not by temperature, but by the supply of water available for tillage (Fig. 142). The irrigation system, by means of channels filled from rivers, reservoirs, and wells, is the greatest in the world, extending over a fourth of the cultivated area, not only in regions of deficient rainfall, as the Indus plain, but also in districts where summer rains are ample but winter rains are deficient. All

* Deccan means South Land.

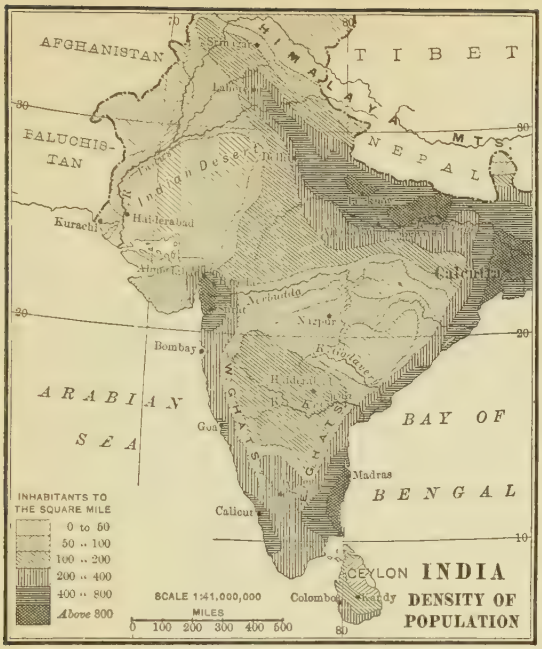

FIG. 142.—The prevailing winds are the southwest monsoon in summer and the northeast monsoon in winter; the moist southwest monsoon brings an enormous quantity of water vapor from the Indian Ocean, a part of which, condensed on the upper slopes of the Western Ghats, gives the southwest coast abundant rain (Fig. 3). Millions of people inhabit that part of the coast line. This monsoon usually carries sufficient rain to the interior highlands, but meeting no great condensing medium till it reaches the northern mountains, most of its great burden of water is deposited on the southern slopes of the Himalayas, where it feeds the Ganges and Indus, and makes the Ganges valley one of the most fertile and populous parts of the world. The moisture-bearing clouds sweep northward across northwest India, parting with little water till they reach the mountains, and giving the vast low region comparatively little rainfall, so that if it were not for the irrigation which the rivers afford the Indus basin would be as sparsely peopled as is the Thar or Indian Desert, which has no rivers and few wells available for irrigation. Observe the strip of more densely peopled country due to irrigation in the Indus basin. Sometimes the southwest monsoon does not continue long enough to give the plateau of the Deccan sufficient rain; then crops fail and famine ensues, the famine areas occasionally extending as far north as Lahore. The drier northeast monsoon, crossing the wide Bay of Bengal, collects some moisture that it deposits on the Eastern Ghats, which, with the irrigation afforded by the east-flowing rivers, increases the capacity of the east coast to support a very dense population.

parts of India except the elevated mountain regions are very hot, so that crops grow the year round.*

Nine tenths of the inhabitants of India are engaged in agriculture. No other part of the world depends so largely upon the fruits of the soil; three fourths of the inhabitants, being Brahmanists, are restricted by their religious faith to an almost exclusively vegetable diet. They are thus deprived not only of a great food resource, but also of a large part of the profit that other peoples derive from the raising of domestic animals and the trade in them.†

Foreign commerce is restricted by the poverty of the people. Most of the inhabitants live on very small holdings. Farmers are always poor if, as in India and China, the land is so minutely subdivided that one holding scarcely suffices for a bare subsistence.‡ Each farmer having little to sell, can buy little. For this reason, India, in which one sixth of the human race is gathered, has small foreign commerce considering its enormous population. The total foreign trade, though very large, is less than $3 a year *per capita*, while Great Britain spends eighteen times as much *per capita* for its chief imports alone (p. 211). In view, however, of the economic condition and small needs of the masses, the commerce of India is developing very rapidly.#

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* Twenty thousand miles of large and small distributaries in the Punjab (northwest India) alone, give fertility to 5,200,000 acres.

† They use small, humped oxen (zebus) or black buffaloes to till the land, every farmer also having a cow to provide milk. The value of their cattle is lessened by the fact that they place no value on beef. Many thousands perish in time of famine whose lives might be saved if they would kill their cattle for food. When the crops fail the Hindus have no other food resource.

‡ It is for this reason that the laws of Sweden forbid the subdivision of farming lands into parcels that will not give comfortable support to three persons. The wages paid to farm laborers in India is about $2 a month.

The intellectual life of the educated and professional classes is on a high plane. Native capitalists have supplied most of the money

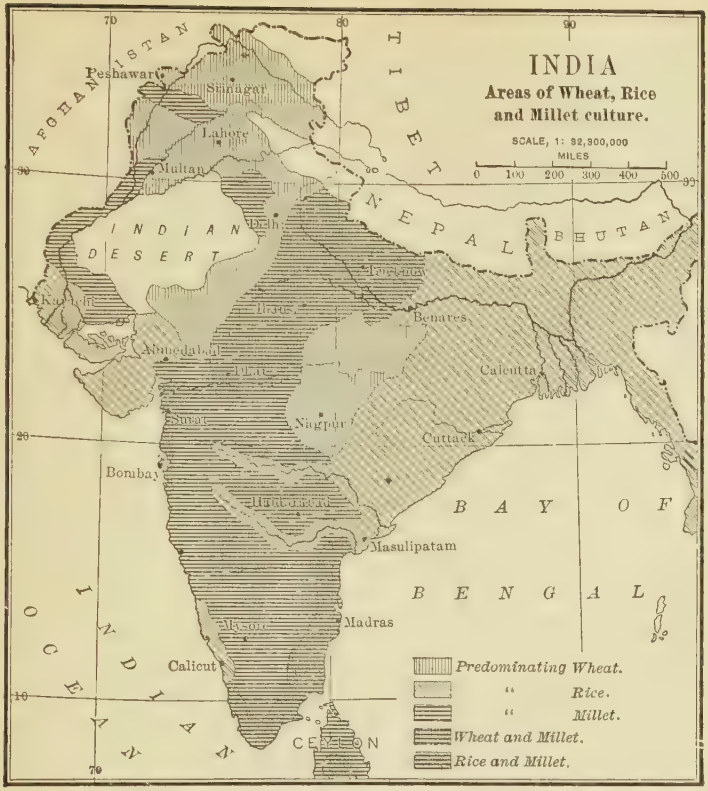

FIG. 143.—The important ports, though few in number, are well distributed to meet the needs of the country. Calcutta, the largest city in the British Empire except London, is the center of business in Bengal. Though the outlet for the products of this rich region, particularly jute, indigo, and opium, it has lost its commercial pre-eminence, Bombay being more important in the shipping trade since the Suez Canal was opened. Calcutta has large jute and paper manufactures. Bombay is the center of commercial relations with Europe, America, and the far East, its Western trade passing through the Suez Canal, the Oriental traffic going by way of Singapore. Its harbor, protected by islands, being the best in India, it commands nearly half of the exterior trade, with wheat and cotton as its largest exports. Its proximity to the cotton fields makes it the largest center of cotton manufactures. The harbor of Madras is merely a roadstead, where cyclones are dangerous for shipping. It handles nearly all the commerce of the southwest, though Masulipatam has a share of it. Karachi is the wheat port of the Punjab. Calicut, which, first exporting calico, gave its name to that fabric, has considerable trade with Western countries.

The wild elephant is now found in India only in the forests of Mysore. Haidarabad is the capital of the largest native state. Peshawar is at the entrance of the famous Khaibar Pass leading into Afghanistan.

Rice and millet are almost the sole food of the larger part of the population (Fig. 143).* As rice grows on hot lowlands where there is plenty of water for irrigation (p. 65), its largest cultivation is in the lower part of the Ganges basin along the rivers, where the fields may be flooded, and on the coasts. As millet thrives in the drier regions it is the predominant crop on the uplands of Deccan and in parts of the Indus basin; thus rice is the chief cereal consumed along the coasts and in the irrigated valleys, while a larger proportion of millet is eaten in the interior. Millet is not exported, and, most of the enormous rice crop of India being required at home, Great Britain draws its rice imports chiefly from Burma, on the east side of the Bay of Bengal.

Wheat thrives best on the dry plains of the Punjab and the plateaus of the central provinces. An enormous stimulus was given to wheat cultivation by the completion of the Suez Canal (pp. 42, 43), India now being the fourth largest wheat producer (Fig. 36); nor could India have been a large wheat exporter without the development of the railroads, which in good years carry so much wheat to Bombay from the central provinces as to exhaust the storage capacity. The wheat of the central region is shipped from Bombay, and that of the Punjab is collected at Multan and shipped from Karachi. Wheat flour, ground at Bombay and other centers, is also a large export. Wheat and flour exports, of course, largely fall off in famine years, as in 1894–'95 and 1896–'97.

Cotton, raw and manufactured, is the largest export (Fig. 144). Indian cotton had its greatest development during our civil war, when nearly all of it was sent to Europe.

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required by industrial development and commercial expansion since the opening of the Suez Canal.

* Millet is one of the grasses yielding a very nutritious flour. It is grown in the United States and Europe chiefly for hay.

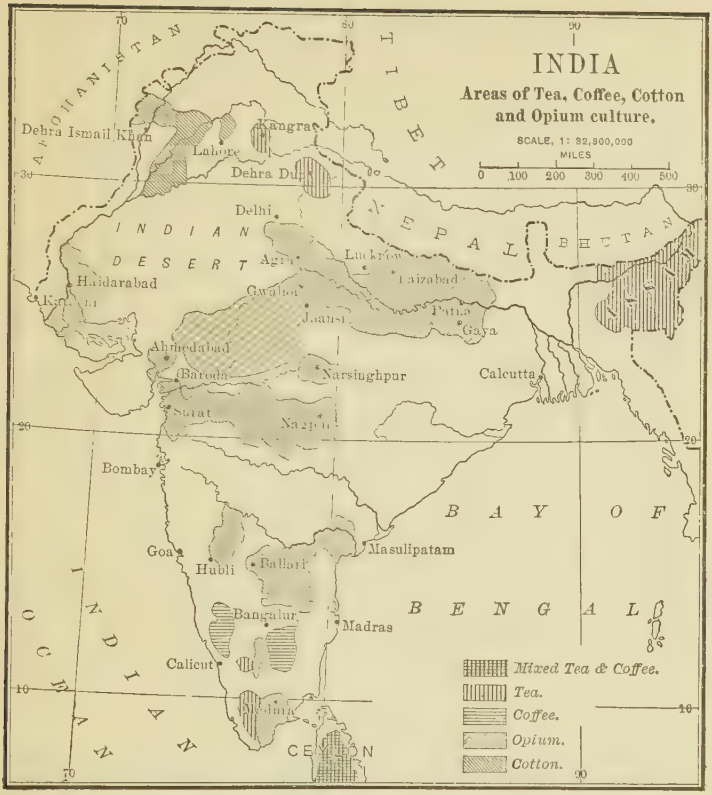

FIG. 144.—Some thousands of Europeans live at Bangalur, one of the most healthful places in south India and a center of the cotton trade. Ballari is one of the chief military posts in British India. Goa, the port of the small Portuguese territory, is dangerous for shipping during the southwest monsoon. Nagpur is important in the cotton trade. Delhi is the first commercial city in the Upper Ganges basin, commanding the trade between the Indus and Ganges basins. Agra, second only to Delhi, is a large trading point. Lucknow, the fourth city in population, is in the center of a fertile region called the "Garden of India," and is important in trade, as is also Faizabad. Lahore is the British center of administration for all the northwest provinces.

India is now the second largest grower (Fig. 52), extensive areas throughout the western two thirds of the country being devoted to the crop. The black, basaltic soil north of Bombay is particularly adapted for the industry. Exports of raw cotton are mainly sent to continental Europe for coarse sheet fabrics, and to Japan. Though the cheap Manchester cotton goods are imported in large quantities, the home industry is steadily growing, India having the advantage of cheaper raw material and labor. India had, in 1906, 5,163,000 spindles and 50,100 looms. Bombay is the great cotton center. The mills, being near the great Chinese yarn market, send large quantities of cotton-yarn to be woven in the homes and factories of that country. Ahmedabad owes its chief importance to cotton mills.

Jute grows better along the lower courses of the Ganges and Brahmaputra, which flows into its delta from the north, than in any other part of the world. Bengal is, therefore, the chief source of supply (p. 103). Nearly the whole crop was formerly exported to Dundee, but the growth of industries has so stimulated the home manufactures that jute gunny bags and other products are now exported to the value of $20,000,000 a year, including practically all the jute, raw and manufactured.

Silk culture is a considerable industry in the Punjab, Assam, and lower Bengal. The fiber is woven in Bengal after European processes, England and France taking nearly all of it. The famous Cashmere shawls, woven from the wool of the Cashmere goat, are made at Srinagar (Fig. 143), which is also the center of the tussar silk trade, the fiber being gathered in the jungles (p. 101). Flax raised only for seed (linseed) is the largest element in the exports of oil seeds. The poppy grown for opium (Fig. 144) is a large source of revenue, its manufacture being a Government monopoly, and Patna the great center of production. Much of it has been exported to China, opium smoking being a prevailing vice in that empire. Indigo has been

a great industry in the Bengal province of Behar, but the synthetic production of this dyestuff in Germany is largely replacing vegetable indigo. Tobacco is grown in the river valleys, particularly near Ahmedabad, Baroda, and Bombay, and also in the south, the export of cheroots being large.

Tea is one of the largest exports (Fig. 144). This hardy plant flourishes wild in Assam, where there are now tea plantations containing hundreds to thousands of acres. Machinery, instead of hand processes, as in China, is used to prepare the leaf for market. India supplies two thirds and Ceylon one third of the Indian teas, which have practically supplanted China teas in the markets of England and the British colonies, and are invading the United States and many other markets that have depended upon China and Japan. Coffee from the slopes of the Western Ghats and Ceylon is also exported.

In a country like India, densely peopled with farmers, there is little room for pasturage except in regions too dry for agriculture ; for this reason cattle raising is most prominent in the lower part of the Indus plain, whence cattle are sent in large numbers to supply the demand for draft animals.*

Modern manufactures are developing. India has been famous for ages for its native textiles, artistic metal working, weapons, and other articles. Every village has its craftsmen of all sorts, and house industries are found everywhere. But many modern branches of manufactures are now being introduced. Besides those already mentioned, tanneries, woolen mills, shipyards, iron foundries, and breweries are among the most important. The greater part of the beer produced is purchased by the Government for the soldiers.

* Considerable coal and iron ore are produced, but most coal and structural iron are imported from England. Bombay, which has shipbuilding among its industries, imports all its coal.

The annual value of the export trade is about $500,000,000. This is in good crop years, when the wheat and cotton exports are large. Raw cotton sent to Europe and Japan, cotton yarn going mostly to China, and cotton textiles popular in East Africa, are sold to the amount of $60,000,000. Hides and skins, oil seeds, and tea, each amount to about $30,000,000, raw and manufactured jute to about $45,000,000, and opium to more than $25,000,000. India being poor in modern metallurgy and general manufactures, these products are imported to the value of over $160,000,000. England has nearly three fourths of the import trade and over a fourth of the exports. The United States has a very small part in the import trade, but buys from India jute and its manufactures, hides and skins, indigo and tea, to the amount of $20,000,000 to $35,000,000 a year.

Nearly half the rice raised in Burma is exported. Enormous quantities are produced on the low-lying coasts and in flooded valleys. Teak thrives on the hillsides, and is also an important export. The world's chief supply of rubies, among the most valuable of all gems, comes from Burma. The Irawadi, navigable for 900 miles, is a fine highway of commerce through the heart of the country between Mandalay and Rangoon, the port in the delta. Burma is administered as a province of India, in whose trade statistics it is included.

The island of Ceylon has a large trade in tea and graphite. It is a mountainous island, a little larger than West Virginia, producing more graphite than any other country, about half of it coming to the United States. Its great tea plantations contribute nearly half of the total exports, graphite a fifth, copra and cinnamon being next in importance.* No tropical plantation colony is more prosperous

* Cinnamon is the aromatic inner bark of the cinnamon tree grown in Ceylon and Java, dried in the sun and used as a spice.

than Ceylon. Nearly 500,000 immigrants from southern India work on its great tea, cacao, cinchona, coffee, spice, and cocoanut palm plantations. The island imports large quantities of rice, as the low flooded lands are inadequate to provide the amount required. Colombo, which commands nearly the entire exterior trade, has a fine artificial harbor.

STATISTICS FOR INDIA AND CEYLON

India

Average Annual Trade (in Million Dollars)

	1840.	1891–'96.	1899.	1901.	1902.	1908–9.
Imports.....	28.0	263.0	293.3	264.3	264.0	417.8
Exports.....	51.0	347.5	374.1	392.0	403.0	486.0

Population (1901), 294,905,479.

Silver is the monetary standard, with the rupee (worth 23⅓ cents in 1896) as the unit of coinage. The sum of 100,000 rupees is called a lac of rupees.

Ceylon

Average Annual Trade (in Million Dollars)

	1891–'95.	1905.
Imports.....	33.8	43.4
Exports.....	30.8	43.3

Population (1907, estimated), 4,000,000.

NOTES AND QUESTIONS

The year 1899 was famine stricken. Observe the striking increase in exports in 1902, when the wheat and cotton crops were large. There is always food enough in India for the people. Famines occur because the dwellers in drought-stricken districts lack money to buy food.

Rice is becoming less important as food. This is because the culture of wheat, millet, and other bread crops is increasing.

Native industries are decreasing, because modern methods of manufacturing articles cheaply are driving them out. This is always the case where machinery and cheaper processes of manufacturing are introduced. Does the change bless the nations? Does not the transformation inflict suffering on thousands of individuals? In Germany the house industries were almost wiped out in the nineteenth century by the new industrial methods.

CHAPTER XXXIX

JAPAN

The plains and valleys of Japan are the sources of its greatest wealth. It is a very mountainous country, parallel ranges running through the largest islands, with many spurs, some of them extending to the coasts. Most of the mountains are magnificently wooded to the summits; the valleys between them and the wide, low plains along the coasts, or intervening between the ranges in the interior, are highly cultivated to the last acre. These valleys and plains fix the site of all the important towns, for the lowlands teem with industry, and nearly all the inhabitants live on them.* Surrounded by sea, whose breezes are laden with moisture, Japan has abundant rainfall and a more equable climate than the neighboring mainland; but the icy winds of the winter monsoon bring plenty of snow, which naturally lies deepest and longest on the west side of the mountains. The high winter winds make navigation dangerous along the west coast; the typhoons of the summer monsoon sometimes inflict much damage on the east coast; thus both coasts have periods of difficult navigation.

*Japan is similar to Great Britain and Ireland in size and population. Fig. 145 shows the four largest islands which are the home of nearly all the inhabitants. Hondo is the largest, and, with the two southern islands, the most important part of the empire. Yezo is coldest in winter, thinly populated, and cultivated only along the coast. There are about 500 other islands of a little importance, besides hundreds of islets. Japan is one of the great earthquake areas, appalling loss of life and property resulting from the severest shocks.

Silk, tea, and rice are the staples of agricultural exports. The mulberry thrives in Hondo, to which silk culture is confined. Three fifths of the raw silk comes from the central area west of Tokio, and one fifth from the northern area, which extends nearly to the north coast of the island (Fig. 145). These districts produce the best quality, their strong, firm fiber be-

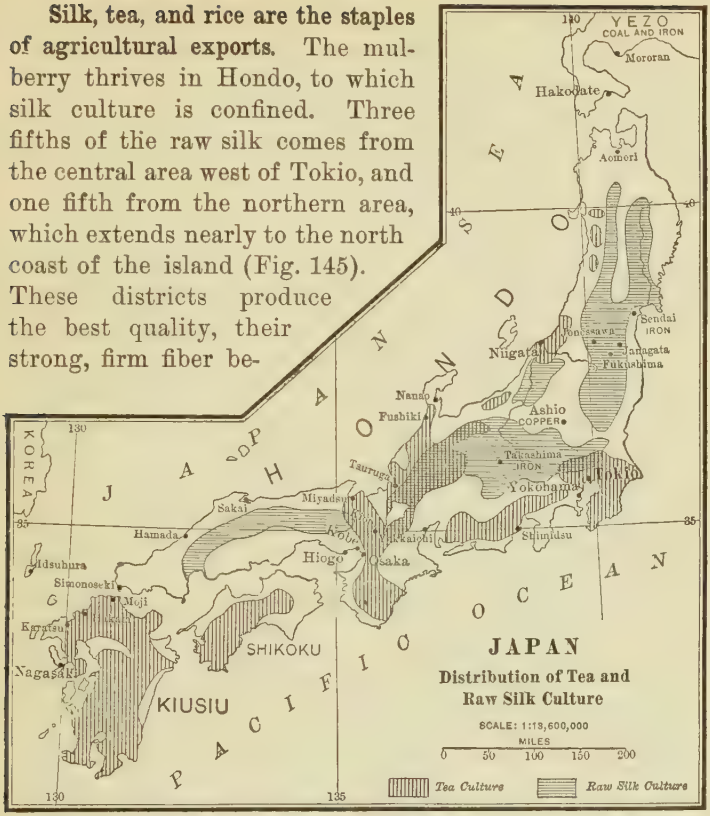

FIG. 145.—Twenty-two new ports were opened to foreign commerce in 1899. Yokohama, which has a spacious harbor, transacts more than half the external trade of the country. It is favored by the proximity of the greatest silk-growing district and of Tokio, the capital and most populous city in the empire, which has no harbor. Kobe is the second port in importance, one of the centers of the tea trade, and other commerce of central Japan. Near it are Osaka, the largest manufacturing city of Japan, excelling chiefly in cotton spinning, and the ancient city of Hiogo. Kioto, noted for its distinctive Japanese industries, sends a great deal of tea and raw silk to Kobe for shipment. Nagasaki, with its shipyards, has the advantage of a neighboring coal field. The map shows a number of the new open ports on the west coast. Niigata is at the convergence of several roads to the sea and on a navigable river. The towns indicated in the northern silk area are old feudal cities, converted by railroads into progressive centers. Aomori, on one of the most beautiful bays in the world, is a fishing center, and forwards goods to and from Yezo.

ing particularly desired by the manufacturing countries for ribbons and laces. The southern district, west of Kobe, supplies one fifth of the total output, which is second in quantity only to that of China (Fig. 55).* About half the raw silk is retained for the manufacture of the characteristic silk fabrics worn in the country and exported in large quantities.

Tea gardens and plantations are scattered over large areas in the three southern islands, and Kiusiu is almost covered with them (Fig. 145). A peculiarity of Japanese agriculture is the large amount of fish caught off the coasts, that is used to enrich the soil; thus, thousands of tons of dried fish are packed around the roots of the tea-plant. Green tea is the main product, the finest qualities being packed in jars to retain the aroma. All the plantations are at a considerable distance from cities and villages, as smoke and other impurities in the air are believed to impair the delicacy of the tea. Three fourths of the exports are sent to the United States.

Rice is grown everywhere in the lowlands, the rice plains of the west coast being rather more extensive, and more than half the crop coming from that side of the islands. Rice is the staple food of the inhabitants; as Japanese rice is preferred in some markets to any other, a great deal is exported, and cheaper rice from other Asiatic countries is imported to meet the home demand. In some years the exports exceed the imports. Wheat and millet are also imported crops and large food resources.

* When diseases half ruined European silkworm culture (1863–'69), Japan was the principal source from which healthy eggs were obtained. As this export absorbed the best Japanese cocoons, silk culture in Hondo greatly declined. Since 1870, however, the production of raw silk has steadily developed, and now exceeds 16,000,000 pounds a year. Yokohama is the great export market, about half the production being shipped from that port to Europe and the United States, the sales abroad of raw silk and its manufactures being a little less than half the total exports of the empire.

SILK INDUSTRY IN JAPAN.

TAKING SILK FROM COCOONS.

Cotton is grown in the south, but supplies only a small part of the fiber required in the growing cotton industries. The native staple is less than three fourths of an inch in length, which is one reason why comparatively little attention is given to its culture. Japan makes most of its cotton fabrics, the imports of raw cotton being worth nearly four times as much as the cotton cloth imported. India supplies half the raw cotton, the United States one fourth, and other Asiatic countries, chiefly China, send the remainder. Considerable Texas cotton is now shipped from San Diego to Japan. The spinning wheel has been almost wholly displaced, since 1880, by spinning mills using machinery. Yarn is the great product of the factories, while hand looms in the homes of thousands of artisans still turn most of the yarns into cloth. The Japanese peasantry thus make most of their wearing apparel from the yarns produced in the home mills. The manufacture of woolen cloths, from wool imported mainly from Australia and China, is a new industry employing several factories.

Animal raising has a subordinate place. This is the case in all countries where rice-growing is a leading industry. There are no donkeys, sheep, goats, or geese in Japan. Cattle are raised for the plow and carrying purposes, but not for meat; milk, butter, and cheese have no part in commerce. A small breed of horses from Korea is raised to some extent. The Japanese fisheries are among the most valuable in the world (p. 92). The Japanese consume, and export to China and other countries, large quantities of fish, carrying on the industry both along their own coasts and on the neighboring shores of Asia, particularly near Korea.

The extensive forests supply most of the timber required, including kiyaki, a very hard wood used for ship frames, and hinoki cypress, used in better-class buildings, furniture, and lacquer ware. Considerable Oregon pine and teak from India are imported. The sap of the lacquer tree (Fig. 146) yields a varnish that is applied to wooden or

metal articles. It is so hard that it is difficult to scratch it, and its polish is the most perfect known. Lacquer ware is one of the most characteristic products, and is a large export.

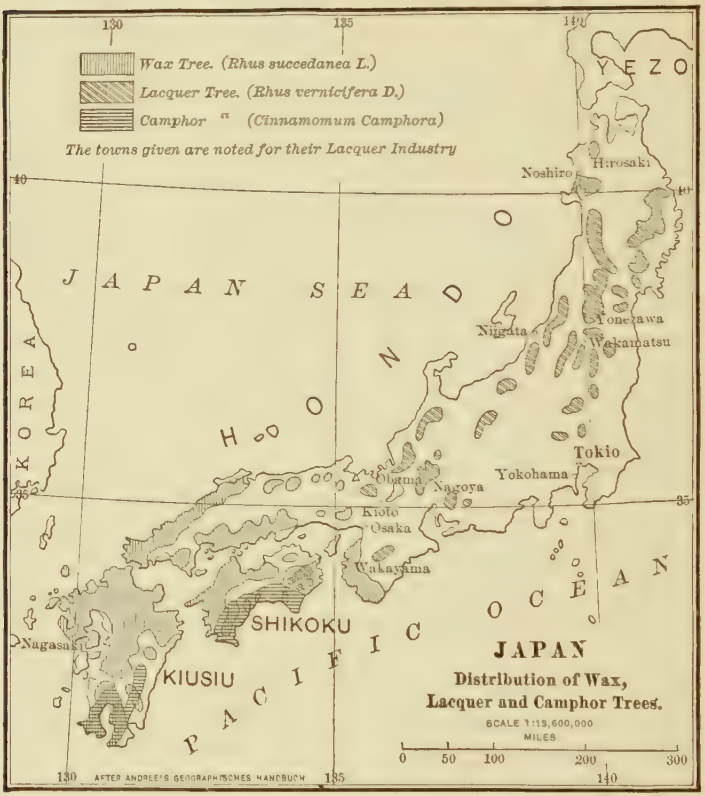

FIG. 146.

Another tree yields vegetable wax, used in candlemaking and in coating paper garments to be worn in wet weather. It is important both in the domestic and foreign trade.*

*Japan wax should not be confounded with China wax, which is an insect product.

The camphor tree is cultivated in south Japan, that country, and particularly the island Formosa being the largest sources of camphor.*

Japan is poor in minerals (Fig. 145). Coal is mined principally in Yezo and Kiusiu, and considerable is exported to Shanghai. The largest copper mines in Asia are at Ashio, copper being the only metal exported. As the iron produced falls far short of manufacturing needs, iron and steel and their products, including some pig iron from China, are large imports. Japan abounds with kaolin of superior quality, of which the famous earthen and porcelain wares are made, and which have a wide sale in foreign lands.

The Japanese desire to make their own commodities. Readily assimilating Western ideas and processes, they have begun the manufacture of many European and American articles which were not even known in their country forty years ago.† Shipbuilding at Nagasaki is one of the most notable industries; small ocean vessels are built in well-equipped yards; there are facilities for the docking and repair of all classes of ships, from ironclad cruisers to coasting vessels. The growth of industrial pursuits has to some extent increased the exports and decreased the imports of manufactured articles. Japan, however, can not seriously compete with the West for the control of the Oriental markets so long as its manufactured products do not compare favorably with those made in Europe and

* The camphor tree, related to the sassafras of the United States, is widely distributed. Camphor gum is used for liniments and other medical purposes; camphor oil is an ingredient in varnishes, oils, and paints. As the tree is cut down to obtain the crude gum, Japanese law requires that a tree be set out for every one felled.

† Besides textiles, they are making matches, saddlery, glassware, umbrellas, brushes, boots and shoes, mathematical and surgical implements, patent medicines, clocks and watches, and other articles, many of which are as yet of inferior quality. So much labor has been diverted from agriculture to other industries, that food costs more, as much must be imported; wages have consequently increased.

America. Labor is cheap, but, considering the quality and quantity of its product, it is not cheaper than in America or Europe (p. 34).*

The foreign trade has increased eightfold in thirty years. France and the United States are the largest buyers of raw silk, the leading export. The raw silk and tea sent to the United States make this country the chief customer of Japan. China is the largest purchaser of sea food and matches. Other Asiatic countries buy large quantities of Japan's cotton goods. Most of the imported textiles, machinery, and iron goods come from Great Britain and Germany. The United States leads in sales of kerosene, sole leather, telephones, tobacco leaf, lumber, and some other articles. Great Britain buys from Japan only one fifth as much as the United States purchases, but her sales to that country considerably exceed those of the United States and India, her nearest competitors.†

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* Inland transportation has been greatly improved by the building of nearly 4,000 miles of railroads; the telegraph and postal services extend to all parts of the country. The Japanese own a large part of the merchant marine connecting their country with other lands, having their own regular steamship lines to our Pacific coast, Australia, Shanghai, Korea, Vladivostok, and Bombay. The Government endeavors to stimulate marine enterprise by a system of subsidies and bounties to steamship lines. An extensive system of banking, regulated by the Government, has been developed throughout the country.

† The island of Formosa became a Japanese possession after the war with China (1894–'95). The mountains of the east side, inhabited by savage aborigines, are still only partly explored. The alluvial and well-watered plains of the west are cultivated by Chinese immigrants, who raise large crops of tea, rice, and sugar cane. Nearly all of the Formosa tea (Oolong and other varieties), regarded by many as the finest exported, is sent to the United States. Formosa, with a product of over 6,000,000 pounds of camphor a year, controls the world's trade in that commodity. The industry is now a monopoly of the Japanese Government, which maintains a large number of guards in the camphor forests to protect workmen from savage foes. Formosa lacks good harbor accommodations, Tamsui and Kelung, the northern ports, where

STATISTICS FOR JAPAN

Average Annual Trade (in Million Dollars)

	1881–'85.	1891–'95.	1899.	1901.*	1903.	1909.
Imports.....	21.3	47	109.7	127.4	165.3	196.3
Exports.....	26.0	51	107.0	124.2	150.6	205.7

Value of Leading Imports, 1908 (in Million Dollars)

Raw cotton.	Sugar.	Cotton textiles.	Kerosene.	Oil cake.	Iron and steel.	Rice.
44.3	9.8	6.5	7.9	12.2	19.2	11.4

Value of Leading Exports, 1908 (in Million Dollars)

Raw silk.	Cotton yarns.	Silk textiles.	Copper.	Rice.	Tea.	Matches.	Mats.	Straw braid.
54.3	10.3	17.2	10.7	2.2	8.3	4.7	2.8	1.6

Population (1905), 47,674,000, including Formosa.

Gold and silver are the monetary standards, with the silver yen (value about 53 cents) as the unit of coinage. English and metric measures are used in foreign trade.

NOTE

"The Japanese peasant, much less favored than the Chinese cultivator on his yellow earth, knows how to work his soil, often infertile, to the best advantage. Not a parcel of cultivable land is unoccupied on the plains, and the slopes of the mountains have been gradually won to cultivation up to the limit of vegetation. In many districts where rocks were entirely devoid of earth the Japanese brought it on their backs and built long walls to keep it from sliding down. Some districts show cultivation in terraces from the mountain tops to the valleys. These steep slopes, won for tillage with infinite patience, are irrigated by an ingenious distribution of water along the mountain sides.

"Thus, the Japanese knew how to help nature; productions taken from the soil thus worked are numerous and abundant."—*Précis de Géographie Économique.*

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most of the commerce is centered, being inferior. Takao, in the southwest, is a better harbor. Anping also has considerable trade.

* The imports from the United States in 1905 were $52,143,264; exports, $47,004,536; 1903, including Formosa, imports, $21,622,603; exports, $40,597,582; 1908, imports, $26,914,000; exports, $65,510,000.

CHAPTER XL

THE CHINESE EMPIRE

China is the largest agricultural nation. All tillable lands are cultivated like gardens, the fruitful soil yielding abundant harvests; but China is not able to sell food to other nations, and is compelled to buy some food from them. It is forbidden by law to export rice from the empire, because sometimes it can not grow all the rice it needs. The natural riches are extraordinarily great, and yet the Chinese people, excelled by none in sobriety and tireless industry, are very poor. They are too closely crowded together on the lands they till. Though China proper is only half as large as the United States, it contains nearly as many people as the whole of Europe. If the whole population of the United States and 40,000,000 more were crowded into the state of Texas the density of population would be about equal to that of the low plains of China, where a third of the Chinese live. The struggle for existence is intense in a country so overcrowded.*

The surface and climate are favorable to large production. An alluvial and highly fertile plain extends between the Peking and the Yangtse-kiang in the east.† A longer but

* The Blackburn Report to the British Government says: "The dreadful poverty of the masses is due to rapid increase of population wherever a district has been spared rebellion and famine for a few tens of years." Large numbers of Chinese emigrate to the Malay Peninsula and other Asiatic lands and have even crossed the ocean to earn a better living.

† The Hoang River, "China's Sorrow," crosses this plain. Millions

narrower plain extends up the valley of the Yangtse and its tributary the Han far across central China. Nearly all the rest of China, two thirds of the whole, is mountainous, with great agricultural development in the valleys and even on the mountain slopes, which are terraced and tilled, particularly north of the Yangtse River, to a height of 8,000 feet. Being in the monsoon region, on the eastern edge of the greatest of land masses, it has in summer the warm, moist winds from the sea and in winter the icy winds from the northern plains; in other words, the summer is very warm with abundant rainfall, and the winter is very cold, which conduces to the energy of the people. The climate is somewhat similar to that of the eastern half of the United States; many of the deciduous trees and other forms of vegetation are identical in the two countries. The combination of monsoon rains with summer heat makes it practicable, however, to cultivate rice and other products of hot countries in north China, as well as wheat and other products of the temperate zone.

Raw silk is the greatest export commodity (Fig. 147). Nearly all the provinces produce raw silk, but nine tenths of the output comes from the low plains of the lower Yangtse, the region west of Canton, and the far upper Yangtse. China is far the largest producer of silk (Fig. 55). Seven crops of cocoons are gathered between March and October, the mulberry plantations being tilled with the greatest care to produce enough leaves for the voracious worms. An important amount of wild silk (tussar, p. 101) is also collected, especially in the north, where the forests, on whose foliage the wild caterpillars feed, are most extensive. About half the raw silk is sent to Shanghai and Canton to be shipped to the United States and Europe. Many of the Chinese silk fabrics sold in Oriental and, to some

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of persons have been drowned in the terrible floods with which the Hoang sometimes covers portions of the plain.

extent, in Western markets are made on hand looms in the homes of the operatives, Western machinery being employed

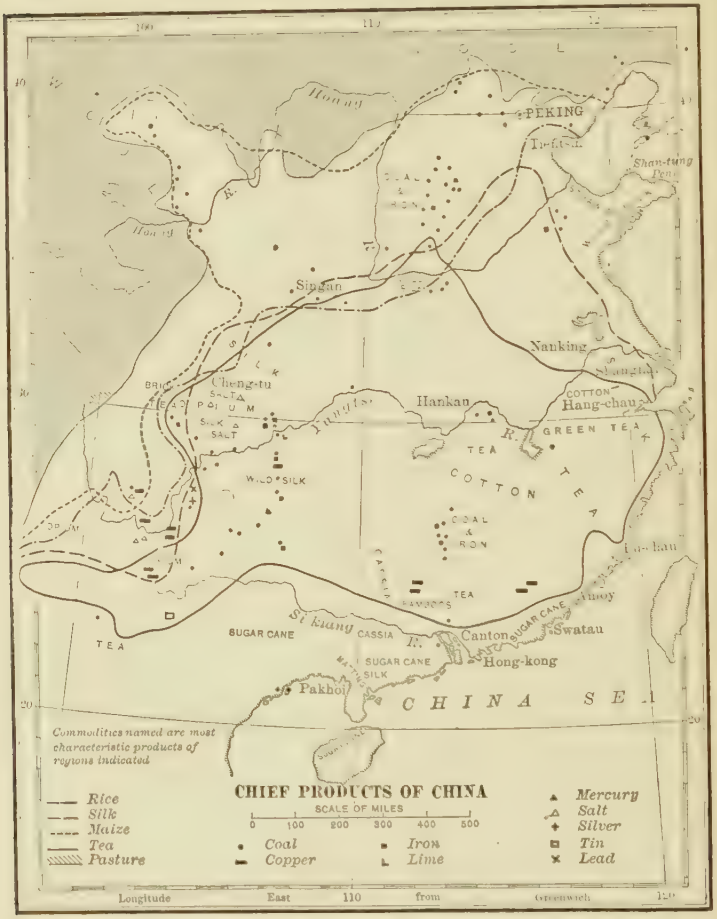

FIG. 147.

in these manufactures only near Shanghai and Canton. The prosperous classes in China wear a great deal of silk,

so that about half the enormous crop is required for home consumption. Nanking and Hang-chau are specially prominent in silk weaving. Silk, raw and manufactured, is about half of the total exports.

Tea is second among the exports. The quantity sent abroad is worth about half as much as the silk exports. Russia is the largest purchaser, much of it being pressed into tablets and sent by camel caravans to Siberia, where it is forwarded to the Russian consumers. In January, 1899, over 19,000 sledges loaded with tea passed west through Tomsk. Most of the tablet tea is superior in quality, there being, however, a large market for inferior teas, which are compressed into bricks (brick tea) for land carriage and sent to Mongolia, Tibet, and Russia. Those teas which the Chinese regard as choicest are in limited supply, and seldom reach the foreign trade.*

Silk and tea were the great instrumentalities in opening the doors of China to foreign trade. Silk fabrics were carried overland from China ages ago to the markets of Eastern Turkestan, merchants from the Mediterranean sending their agents to Central Asia to buy the precious products. Two trade routes were opened to supply India with silks, one overland from western China to the mouth of the Ganges, and the other southward from Bokhara to the mouth of the Indus; thus the Indian market became more valuable to the West, because China's silks might be bought there; in the course of time the Chinese and the Western

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* The Chinese tea trade has greatly declined on account of the competition of the teas of India and Ceylon. Tea-growing in China is a garden culture, while the tea plantations of India and Ceylon are sometimes thousands of acres in extent. These large plantations permit the use of machinery in tea-curing, which in China is mainly a hand industry. Both green and black teas are large exports from China, the United States being China's best customer for green and Russia for black teas. Black teas are the larger part of the exports from India and Ceylon, going mainly to Great Britain and the British colonies.

merchants met and began to trade without the aid of middlemen. The tea trade, later, had an even more rapid and powerful effect in bringing China into commercial relations with the Occident. The growing demand for tea in the West gradually encouraged the Chinese to raise more tea; then they began to consume one and another foreign article which they took in exchange for their tea; thus the way was opened for the advent of the missionary and the Western trader on the soil of China.

Cotton is very important in the domestic and import trade. China produces one of the largest crops and consumes nearly all of it. The beautiful white fiber is no longer than the shortest American upland, which impairs its value in foreign markets, though Japan buys some of it. There are no cotton plantations, most of the fiber being raised on little patches of ground by every farmer in the cotton areas, which are most extensive along the lower Yangtse (Fig. 147). They sell very little of their crop, the women of their families spinning and weaving it, and selling the surplus cloth to their neighbors.* As the masses wear nothing but cotton and China grass (p. 103) even in the coldest winter weather, enormous quantities of yarn and cloth must be imported. The yarns purchased from Japan, India, and England are sold far and wide among the women who make cloth in their homes, as well as to the cotton factories of Shanghai and Wuchang, where steam spinneries also add to the yarn supply. Cotton cloths are by far the largest imports, the United States having the lion's share of the north China trade through Shanghai, while England supplies most of the south China demand through Hongkong.

The woodlands have largely disappeared. This is to be expected in any country where every acre that will produce food is needed for that purpose. East China is nearly de-

* The oil extracted from the seed is used as an illuminant.

nuded, the best timber being in the north and west. A number of forest growths are of commercial importance; most of all the bamboo, thriving in south China as well as in all the warmer parts of Asia, from whose light, hard stem houses and bridges are built, and furniture, weapons, and many other articles are made; cassia, a coarse variety of cinnamon; the wax tree, a variety of oak whose wax, deposited by an insect, serves all the purposes of beeswax, the product being worth over $1,000,000 a year; and the tallow tree, whose seeds are covered with a greasy substance, used in making candles. Our Pacific coast lumber is a valued import in east China.

Animal raising is not very important. This is the case in all Buddhistic countries; the densely peopled parts of China, moreover, have little land to spare for pasturage. All the domestic animals are raised, including the camel, the freight carrier in Mongolia and Manchuria. Poultry are very numerous, supplying, with hogs and fish, most of the animal food. Eggs are a large export to Japan. Chinese fisheries are among the leading industries and give employment to several million persons, the sea and river fisheries being of enormous value. Fish hatcheries, comparatively new in the West, have been maintained in China for centuries.

The mineral wealth is very great (Fig. 147). The coal fields are supposed to be the most extensive in the world; those of the north (Shansi) are believed to exceed the coal districts of Pennsylvania in area. Though iron ores are closely associated with the coal, this rich district and many other mining regions will be undeveloped until railroads reach them. The cost of carriage from the coal mines of Hunan makes it impracticable to sell coal at a profit if it must be carried more than twenty miles to the river boats that distribute it to towns on the Yangtse. The country abounds with superior china clays, which are the basis of the renowned porcelain industries. Yet with all

this wealth mining is so little developed that China depends upon imports for most of its metals.

The industrial development is very important. Judged by Western standards, the products are inferior, but on the whole they are honestly made, for hard service, and are the best manufactures of the Orient.* The Chinese employ little or no machinery and do not understand the advantages of division of labor (pp. 2, 3); each product is the work of a single artisan. Manual skill and lamentably cheap labor (ten to twenty cents a day) supply, to some extent, the advantages that machinery would give. The textiles woven in winter by the country people are most important, after which come metal, glass, china ware, basket plaiting, and other industries. The Chinese excel in working copper and bronze, their wares and art objects in these metals being widely esteemed; ivory, wood, and stone carvings, also justly renowned, have Canton as the center of production and trade. The iron works erected at Hankau on the Yangtse and at neighboring Hanyan turn out rifles and small cannon, but the products are inferior and costly, though the works, equipped with modern machinery, are under expert foreign superintendence. The manufactures most important in exports are straw braid, which competes in Europe with Swiss and other braid, paper, fireworks,† matting, china and stone goods, fans, and bamboo articles.

The cost of transportation largely affects foreign trade. The most important articles of export have high value in

* The Japanese excel in beauty of finish and the attractive qualities of their wares, which, however, are not so lasting, as a rule, as those of the Chinese. The Japanese are superior in lacquer, enamel, and some other art works.

† Most firecrackers are made in the homes of the persons who sell them. The cheapest straw paper and powder are used, with better paper for the wrappers. After forming the paper cylinders they are tied in bunches of 200 or 300, clay being spread over one end and

proportion to weight and bulk. They originate chiefly near the sea or the Yangtse and its largest tributaries* (Fig. 148). The average cost of transportation in most of China is two or three times as much as in countries provided with railroads.

Great Britain and her colonies control more than half of the trade. The British trade, however, is declining, owing largely to the decreasing purchases of Chinese tea and the growing sales of United States cotton goods in north China. Cotton cloth, opium, petroleum, hardware, and sugar are the largest imports; raw and manufactured silk, tea, hides, paper, and china ware are the most important exports. Imports from the United States are mainly cotton goods, petroleum, flour, and lumber, the exports being tea, raw silk, and a few other articles.

Manchuria is the most valuable part of the empire out-

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forced inside each cracker with a punch. The powder is then poured in at the other end, the fuse, Japanese paper made of the inner lining of the bamboo, is inserted, and the edge of the paper is turned in with an awl. Forty persons, each earning five to seven cents a day, can make 100,000 crackers a day. The exports, nearly $2,000,000 a year, come mostly to this country. They are only a small part of the output, as firecrackers are mainly consumed at home.

* The great highways are the Yangtse River, navigable for large steamboats to Ichang, about 1,000 miles, and for smaller vessels through difficult rapids to Chung-king; and the Grand Canal from Hang-chau to Tientsin. Many of the earlier canals are now in ruins: the cost of transportation on many waterways is increased by rapids, as on the Han and other tributaries of the Yangtse and on the West (Si-kiang) of Canton. The great Hoang ho is too rapid and shallow to be utilized except in stretches; still, by means of small boats, flatboats, pole-men, and tow-men, an enormous amount of freight is moved on the waterways (p. 39). The railroad mileage is slowly increasing and before many years China will have a considerable number of trunk lines where most needed. The very poor land routes consist of bullock-cart roads, paths on which wheelbarrows are trundled, or human porters or pack animals are employed. In west China the cost of freight haulage is about 25 cents a ton per mile (compare p. 149).

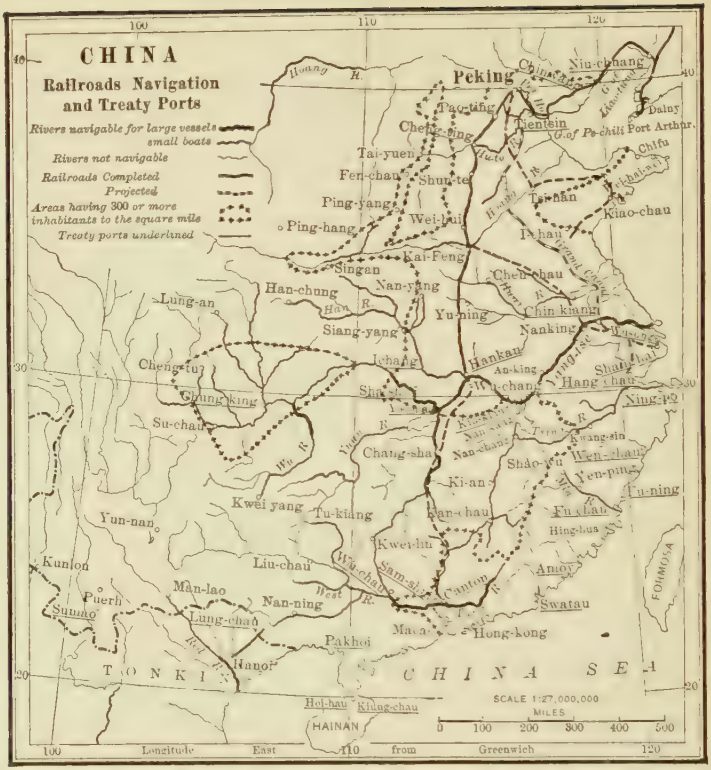

FIG. 148.—Foreign vessels are admitted to thirty-four treaty ports on the coasts and rivers, where foreigners are permitted to engage in business. The treaty ports having the largest foreign trade are Shanghai, near the Yangtse mouth (Fig. 16), the distributing and collecting point for the foreign trade of the Yangtse valley and north China, which receives and forwards a larger amount of commodities than all the other treaty ports together; four fifths of all goods received here are dispatched to other parts of China or to foreign ports; Tientsin, the second largest city in China, on the Pei-ho, the port of Peking and the northern terminus of the Grand Canal; Hankau, at the junction of the Yangtse and Han Rivers, which has the largest river traffic in China, and is the greatest tea market; four miles of water front are constantly lined with junks; Canton, the largest Chinese city, the great seaport of south China; 300,000 persons live in boats along the water front; Niu-chuang (Newchwang), the port of Manchuria, which is ice-bound for four months; about half its import trade is with the United States, chiefly cotton goods; Swatau, east of Canton, comes next, followed by Chifu, at the entrance to the Gulf of Pe-chili, which has an important trade in United States cottons. The eighth port in amount of business is Chung-king, on the upper Yangtse, the outlet for the rich province of Szechuen, first reached by a steamer in 1898 in spite of the rapids above Ichang. Chin-kiang owes its great importance as a port to the fact that it is the lowest point of the Yangtse where a large harbor is possible, and at the junction of the river and the Grand Canal. Amoy and Fu-chau are tea-shipping ports. Peking, the capital, has little commercial but large political importance.

side of China proper.* It is a grassy plain, shut in on the east and west by mountain ranges and traversed by the large, navigable Sungari and Nonni rivers; it raises the cereals and other crops of the north temperate zone. The largest extent of pasturage in the empire is in Manchuria and Mongolia, cattle, and particularly goats, being numerous in Manchuria. The exports sent into China, except along the northern border, consist of opium, beans, wheat, millet, ginseng,† and skins. Wheat and hay are sent into eastern Siberia along the northern border; the Russians also hold Manchurian lands under lease, and send their products north across the Amur. The branch railroad extending from the Trans-Siberian line to Port Arthur (Fig. 140) crosses Manchuria, but Japanese influence is now predominant. Manchuria is one of our best Eastern customers.

Wool is the chief product of Mongolia. Most of Mongolia is a dry plateau, which would be very fertile if it were well watered. Farming is confined to a strip along the Chinese border, but parts of the plains supply sufficient herbage for large numbers of goats, sheep, horses, and camels. Urga (Fig. 140) is a large market for the sale of live stock from the plains, and of general merchandise brought from Peking and Siberia. The great tea caravans from Peking pass through Urga on the way to Siberia.

Eastern Turkestan has trade with China, Russia, and India. The province is mostly a sandy waste interspersed with oases. The most valuable part of it is the extreme west, bordering on Russian Central Asia and India, where many streams give the greatest fertility to the bordering lands. Kashgar is the largest center of trade with Russian

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* More than half of the empire is embraced in the distant provinces Manchuria, Mongolia, Eastern Turkestan, and Tibet.

† Ginseng is an aromatic root highly esteemed for medicinal purposes in China, though not regarded as important by Western physicians. China procures it from Manchuria, Korea, and from this country—New York, Ohio, Minnesota, and West Virginia exporting it.

Turkestan; it sends to China much of its supplies of the highly prized jade.* Yarkand sends hides, skins, leather, and gold into India.

Tibet is open to British trade at three towns. This concession was forced from Tibet by the government of India which sent an armed expedition to Lhasa in 1904. Tibet resisted but was compelled to open Yatung, Gyangtze, and Gartok to British merchants. British agents are stationed at these towns. Tibet is the loftiest plateau in the world.† It is on a level with the highest peaks in the Alps. There are three very bad roads from Lhasa into China, on which the trade is carried by horse, mule, or yak caravans. China sends enormous quantities of very poor brick tea, and white and blue cotton goods, receiving in return gold, skins, and musk.‡ Considerable gold and wool also reach the markets of India and Russia. Carpets, leather, and other articles required by the inhabitants are manufactured at Lhasa and elsewhere.

Hongkong is the most important foreign possession in China (Fig. 149). The port of Victoria on this little island, acquired by England in 1841, is one of the most important in the world, being surpassed only by two or three other ports in amount of commercial movement, the entry and clearance of vessels giving a tonnage of nearly 23,000,000 a year. Hongkong, open free to the commerce of all nations, is an entrepôt for the merchandise of the Orient and the Occident. Enormous quantities of commodities from Asia

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* Jade (nephrite), a green stone, is regarded in China as sacred. The Chinese fashion it with great care into bracelets, thumb-rings, carved vases, and other articles.

† Its average height is 13,000 feet, and in the north it attains as much as 15,000 feet. Since 1894 foreigners have been allowed to live at Yatung, near the frontier of India.

‡ Musk is a substance obtained from the male musk-deer of Central Asia, used as a basis of perfumery and, to some extent, in medicine.

and its islands are taken to Hongkong to be shipped to many countries, which in turn send their goods to Hongkong to be distributed by smaller vessels to the various Asiatic ports; thus Hongkong is a great receiving and forwarding station. The largest part of the trade is with south China, just as Shanghai handles most of the trade of the Yangtse valley and north China. In 1898 China leased to Great Britain about 400 square miles of land and water around Hongkong in order to secure the defenses of the island and give room for commercial expansion.

FIG. 149.—The dotted line shows the extent of the territory around Hongkong leased to Great Britain in 1898.

The town of Macao, near Canton (Fig. 148), is the Portuguese possession in China. Its harbor does not admit large vessels, and it has lost most of its importance since the British acquired Hongkong, but it is still important in the opium trade. Great Britain has an excellent harbor at its naval station, Wei-hai-wei (Fig. 148). The German concession of Kiao-chau Bay, with the territory around it, includes one of the best harbors in China, the natural outlet for the minerals and other products of the rich province of Shangtung.

STATISTICS FOR CHINA

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS)

	1891–'96.	1898.	1901.	1902.	1908.
Imports.....	146.0	145.4	203.4	198.4	254.5
Exports.....	149.0	110.3	124.5	134.7	178.5

IMPORTS FROM LEADING COUNTRIES, 1908 (IN MILLION DOLLARS)

Hongkong.	Great Britain.	Japan.	India.	United States.	Germany.
97.5	47.1	34.1	19.7	26.6	9.1

EXPORTS TO LEADING COUNTRIES, 1908 (IN MILLION DOLLARS)

Hongkong.	Germany.	Japan.	United States.	Great Britain.
59.8	4.6	24.1	15.3	8.1

Population (1908), China proper, 408,000,000.

The silver dollar, coined at the Canton mint, is of the same value as United States or Mexican silver dollars. Trade statistics are computed in the haikwan tael, which varies in value from 65 to 72 cents.

NOTE

The Chinese farmer, in the most favored regions, gathers large crops, but in other districts he has not utilized the soil to such great advantage as, for example, the inhabitants of parts of the Mediterranean coasts. The yellow earth of the "loess region" is as fertile as the famous black earth of Russia, and occupies a much larger area. To till this rich soil the Chinese have pushed deforestation to the extreme, and thus increased the evil of destructive floods in the rivers. These great floods cause dreadful devastation, but at the same time have an importance for agriculture. They deposit rich sediments over the flood plains, and thus increase the fertility of the soil.

China is wonderfully rich in her supply of labor; and her toilers love to work, and are temperate and patient. This is of great importance for China's future.

CHAPTER XLI

OTHER COUNTRIES OF ASIA

PERSIA, MASKAT, AFGHANISTAN, STRAITS SETTLEMENTS, SIAM, FRENCH INDO-CHINA, KOREA, DUTCH EAST INDIES

Russia and England are rivals for the trade of Persia. For this reason Russia has closed the best line of entrance to other nations. Persia, an absolute monarchy, more than twice as large as Texas, has three main lines of communication with the Western nations. The first is through Tabriz, the large trade center in the northwest, by caravan track among the mountains of Armenia to the Turkish port of Trebizond on the Black Sea coast of Anatolia (Asia Minor); this route is difficult, costly, and declining since Russia built railroads to the north of Persia. The second is through the Black Sea and over the Caucasian Railroad to the Caspian, where steamers connect Baku with the Persian town of Resht, other frontier towns being within easy reach of the Trans-Caspian Railroad; but Russia, in order to keep the markets of north and central Persia for her own commodities, forbids the transport of foreign goods through the Caucasus to Persia. England, the United States, and other nations therefore trade with Persia by the sea route to the ports of south Persia in the Persian Gulf.

Difficulties of transportation and lack of capital dwarf the commerce of this rich country. It is an elevated tableland, a third of it desert and salt plains, with other irrigated plains and valleys, watered from the mountains and grow-

ing wheat, the poppy (opium), raw silk shipped to Western markets, cotton sent to Bombay, Moscow, and Marseilles, excellent tobacco known throughout the western half of Asia, and dates exported through the Persian Gulf. Attar of roses is a famous product of the rose gardens of Shiraz. Persian horses and mules are noted for their superior qualities. The mineral resources are very large, but mining is neglected because roads are few and machinery is lacking. Practically all the turquoises in the markets come from the mines of Nishapur in the northeast part of Persia.* The most important manufactured export is Persian carpets and rugs, made by hand in many mountain villages widely scattered over the country. They are made in a great variety of patterns, no two being alike.

The Karun River, emptying into the Persian Gulf, being navigable for small steamers, is advantageous for the trade of south Persia. A good freight road has been built between Resht and Teheran, the capital, for the benefit of Russian commerce. Poor caravan routes connect the main centers of trade, Tabriz, Teheran, and Mashad in the north, Ispahan, Yezd, Kerman, and Shiraz in the center and south; these towns are connected by roads with trading points along the northern frontier and the ports of Bushire, Linga, and Bandar Abbas on the Persian Gulf.

The imports are much larger than the exports, consisting mainly of cotton and woolen goods, glass, carriages, sugar, kerosene, and tea and coffee; the exports are opium, cotton and wool, silk, dried fruits, carpets, pearls, turquoises, and attar.†

The vicinity of the Bahrein islands in the Persian Gulf, a British possession, is one of the largest centers of pearl

* These mines, employing about 1,500 persons, are opened in the solid rock by picks or blasting. The stones are cut at Mashad, most of them being sent to Moscow or sold to wealthy Persians.

† The foreign trade in 1908 was: Imports, $31,077,000; exports, $25,987,000.

fishing, some thousands of men and 400 boats being employed. The yield is about $1,000,000 a year.

Oman, an independent sultanate (on the southeast coast of Arabia), is barren and desolate along the coast, but irrigated valleys among the hills produce fruits, vegetables, and, most of all, dates, the chief export. British and Hindu merchants are established at Maskat, the capital, which trades with India, the Red Sea, and Zanzibar.

Aden is a free port, serviceable to all the great trading nations (Fig. 154). This British town, on the southwest coast of Arabia, has an excellent harbor, and is one of the most useful coaling stations for merchant vessels in the world. As it is open to all nations, it is a receiving and forwarding point for the commodities of the surrounding countries, sent to Aden in small vessels and transshipped to ocean liners for various parts of the world.* The United States has a large share in its trade, importing sheep and goat skins, Mocha coffee, and ivory, and exporting great quantities of unbleached cotton fabrics that are sold to Arabia and northeast Africa.†

Tin is the chief export of the Straits Settlements. This crown colony of Great Britain occupies the southern part of the Malay Peninsula and is commercially notable for two reasons: The native protectorates, included in its territory, produce about one half of the supply of tin, which is smelted at Singapore in the largest tin smelting works in the world. Tin is about one sixth of the total exports, the

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* The imports in 1908 were $14,026,305, and the exports $14,903,850.

† Afghanistan, the "buffer state" between Russian Central Asia and India, has very little exterior commerce. It is one of the sterile, waste places of the world, with some fertile valleys, where the nomad, warlike populace, restrained to some extent by the stern rule of their Ameer, breed camels, sheep, and goats, and make excellent fabrics of wool and hair. Some machinery has been imported to Kabul, the capital, where firearms and other articles are made under British superintendence.

United States buying half of the metal used in its tin-plate mills from this source. The other conspicuous fact is that the colony fronts upon the Straits of Malacca, a narrow gateway between the Occident and the Orient, where it is convenient to have an entrepôt for the collection and distribution of the commodities both of the East and the West. As Singapore, with its large, landlocked harbor, fulfills the requirements of a great receiving and forwarding port, it shares this large business with Hongkong. Much of the tin, sugar, tobacco, sago, rice, rattan,* hides, rubber, gutta-percha, copra, spices,† coffee, and other products of the East and the general merchandise of the West are taken to Singapore and transferred to steamships going to all parts of the world, excepting South Africa. The steamship movement at Singapore is about 6,000,000 tons a year, in addition to a large number of small native coasting vessels. Malacca and Penang, formerly of great importance in international trade, have declined with the growth of their rival. Singapore is also an important coaling station.

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* The rattan, one of the palms, abounds chiefly in the East Indies, the best coming from Borneo. Walking sticks, chairs, chair bottoms, the fancy bodies of carriages, and baskets are made of it.

† The Malayan Archipelago and the neighboring mainland are the source of most of the spices. Mustard, however, which is commercially the most important, is grown in most parts of Europe and the United States, as well as in the East Indies and Asia Minor. Black and white pepper, among the most common spices, is collected from nearly all the islands of the archipelago and shipped from Singapore. Red peppers (Chile and Cayenne peppers), though natives of South America, are now widely grown in warm countries. The nutmeg is the kernel of the fruit of a tree growing in the Banda and other Malayan islands; mace is the inside covering of the nutmeg. The clove is the dried bud of the clove tree exported from the East Indies, but most of the crop comes from Zanzibar and the neighboring island of Pemba. India, China, and West Africa add their supplies of ginger to those received from Jamaica and other Western regions. A large part of the ginger of commerce is shipped from Calcutta. This country imports far more pepper than any other spices. Most spices are on the free list.

Rice is the chief export of Siam. The richest and most populous part of the kingdom is the valley of the Menam, which has somewhat the same relation to Siam that the Nile has to Egypt. Upon the rise and fall of the Menam depend the crops of rice that are grown extensively on the flat, alluvial lands of the delta, forming not only the main article of food of the Siamese, but also the principal product and export. Siam is surpassed only by Burma and Cochin China in exports of this commodity (from $25,000,000 to $28,000,000 a year), about four fifths of the total exports. The grain is consumed mainly in China and Singapore. While the south of Siam is a flat delta region, the north has fine mountains and dense tropical forests, in which the teak tree is the most valuable timber (p. 108). The teak industry is almost wholly in the hands of British firms, who employ natives to fell the trees, and use elephants to drag the heavy logs to the streams. When they reach the Menam the logs are fastened together in enormous rafts and floated 500 miles or so to Bangkok, where they are squared in saw mills and sent to London and other markets. Danish and Dutch steamers afford the only regular communications between Bangkok and Europe, most of the trade being transshipped at Singapore or Hongkong. Bangkok, twenty-five miles up the Menam, can not be reached by large steamships. The better classes, while intelligent and progressive, are opposed to dredging the Menam to Bangkok, on the ground that the improvement would enable foreign war ships to bombard the city.

Rice is the chief product of French Indo-China. Of the four dependencies included in French Indo-China—viz., Cochin China, Cambodia, Annam, and Tonkin—Cochin China is the oldest and most prosperous colony. It consists mainly of the alluvial lands of the Mekong River delta, which is covered with rice fields, the unfailing water supply and the uniformity of the climate being peculiarly favorable to this crop. Cochin China sends more rice than any

other country to Hongkong and Singapore to be distributed to the Philippines, China, and other Asiatic lands. The exports exceed 500,000 tons a year, France taking most of the crop that is not sent to Oriental countries. Fish, salt, cotton, and pepper (the latter, harvested in January and February, supplying most of the needs of France) are other important exports. The port of Saigon has a commercial movement of 600,000 tons a year. Cambodia, which has no sea front, carries on its very small external trade through Saigon. The coasts of Annam raise so little rice that fish is the staple food of its 5,000,000 inhabitants. Over 30,000 persons engage in the fisheries along the coast, the salt fish sent to Tonkin, China, and Singapore supplying a considerable part of that commodity consumed along the south coast of Asia. Tonkin is the most populous part of the French possessions, but it is least developed. Most of its great rice crop is needed for home consumption. All these dependencies are rich in resources, but their development, except in Cochin China, is in the future. Only a small part of their imports come from France; England, the United States, and Japan supplying most of the textiles, general manufactures, and kerosene.

The foreign commerce of Korea doubled in the five years ending in 1899. Korea, formerly called "The Hermit Nation," is now rapidly opening to foreign trade and influence. As the country is almost wholly agricultural, beans, hides, and ginseng are the only exports of importance, except gold taken from mines under American management. The export of rice is prohibited. Cotton cloths are more than half of the imports, silk goods and kerosene being also very important. Cotton yarn, imported from Japan, is woven into fabrics that have a ready sale on account of their durability. Chemulpo, the chief port, accessible only at high tide, is connected with Seoul, the capital, by a railroad. Steamship lines connect the country with Japan, China, and Vladivostok.

The Dutch East Indies contribute far more to foreign trade than the other colonial possessions in Asia. This is due largely to the Dutch colonial system, which has its best development in the island of Java. All the native sultans, chiefs, and police are in the pay of the Government, the Dutch ruling through the natives, but requiring strict compliance with the laws. It is to the interest of the governing natives to compel the people to be industrious and law abiding. The Dutch Government itself, under the name of the Netherlands Trading Co., plants and sells crops. Its net revenue from Java, about $16,000,000 a year after paying all expenses, is the result of toil and enterprise and not of burdensome taxation.

The most important Dutch possessions are Java, Sumatra with the neighboring small islands of Banka and Billiton, Dutch Borneo, the southern half of that large island, and Celebes. The pearl of the whole archipelago is Java, the most densely populated land near the equator. All the lowlands and the mountain sides to a high elevation have been turned into gardens. Rice, sugar cane, and tobacco are raised on the lower lands. Java has been the largest producer of cane sugar (Fig. 45) only since the Cuban insurrection of 1895. In the middle zone are the coffee plantations, Java coffee being exported to all parts of the world. Still higher are the tea plantations, which yield about 23,000,000 pounds a year. Java is also the largest producer of cinchona bark (quinine). Its oil wells are reducing the imports of kerosene and supplying a part of the Eastern market. Little of its cotton (about 2,500,000 pounds a year) is exported.

The products of Sumatra are similar to those of Java, except that it raises a far larger quantity of tobacco, its chief export, of which $4,000,000 worth a year is sent to the United States. Black pepper and gutta-percha are also important exports. The little islands Banka and Billiton are among the large sources of tin (Fig. 66). Dutch Borneo

has considerable trade in gutta-percha and gold, but its resources are mostly undeveloped. Spices are a large export from the Moluccas or Spice Islands; nearly all the nutmegs in trade come from the nutmeg gardens of Lontar, the largest island in the group. Celebes has little part in foreign commerce, except that the port of Makassar, the chief town, is a forwarding port for all the commodities, mostly bêche-de-mer,* pearl shell, tortoise shell, birds of paradise feathers, and spices from the eastern Dutch islands. A number of the smaller Dutch islands have considerable trade in coffee, cacao, and spices. The port of Batavia, in Java, is the commercial center of the Dutch East Indies, through which the larger part of the exports, most of them sent to the Netherlands (p. 254), are forwarded.†

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* A sea slug of the East Indies, whose dried flesh is esteemed by the Chinese in their soups.

† A part of north Borneo, about as large as Great Britain, is under the protection of the British Government. Among its exports are edible birds' nests (to China), coffee, pepper, timber, and camphor sent to Singapore for forwarding to Great Britain and the colonies.

The imports of the Dutch East Indies in 1908 were $92,000,000; exports, $146,000,000.

CHAPTER XLII

AUSTRALIA

Australia is the greatest sheep- and wool producing country. This fact alone would stamp it as a region of prevailing dryness. It is the smallest of the continents, being about as large as the United States exclusive of Alaska, and is the only continent that lies wholly in the southern hemisphere. Like South America and Africa, its outline is regular; having few deep inlets, it is deficient in good harbors. Only on the eastern and southeastern edge are there long ranges of mountains, the rest of Australia being a flat lowland, diversified only by isolated groups of mountains or hills. The eastern mountains retard the progress of the prevailing east winds (the southeast trades), and deprive them of most of their moisture. The narrow east coast, with long and comparatively narrow strips of farming lands between the mountains and the sea, is therefore abundantly watered (Fig. 150). A wide area west of the mountains, receiving only small rainfall from the nearly dry winds, grows little but grass. This is the great, steppe-like grazing region, particularly adapted, on account of its dryness, for the raising of sheep, which feed by millions on the stations.* Cattle are in large numbers, but except in the moister regions of Queensland, the grazing lands are not so favorable to them as to sheep. West of the grazing lands stretches the desert, in whose sandy waste explorers

* Ranches in Australia are called stations or runs. Ranchmen are called squatters.

have disappeared and left no trace. The great summer heat of the desert draws monsoon rains from the northern seas, covering the north coast with tropical verdure. The prevailing westerly winds, "the roaring forties," are too far south to benefit the western half of the south coast, but the southeastern prolongation of Australia catches considerable of the rain they bring, placing wheat and other

Fig. 150.

crops among the sources of wealth in the southern portions of South Australia and Victoria. Areas of grazing, farm lands, and forests relieve the monotony of the low and sandy west coast.

Most of the people are farmers, sheep growers, and miners. Only seventeen towns have a population of more than 10,000. New York city has about nine tenths as many

inhabitants as the entire continent; but, though the population is sparse, the purchasing power of the people is very large. Their foreign trade, in proportion to population, is much larger than that of most nations.*

Stock-raising is far more important than agriculture (Fig. 150). As sheep grazing is less dependent upon rainfall than other pasturage, sheep are the main dependence and wool (largely merino of a superior quality) is the great product. Wool is more cheaply produced than in most other countries, because the flocks, living in the open air throughout the year, require no winter fodder, and pasturage and labor are very cheap. The grasses of the pastoral regions are very nutritious. New South Wales has more than half of the sheep, wool being the staple export. The railroad system was extended far into the plains to the Darling River (Fig. 152) solely to meet the demands of the wool trade. New South Wales has the advantage of many streams from the mountains, which flow through the plains and, being subject to floods, grow luxuriant grass along their courses, besides giving the flocks abundant drink. Queensland is second in the number of sheep; one reason for extending railroads to Charleville and Hughenden was to develop wool growing on the excellent pastures

* The foreign trade of New South Wales in 1894 was $240, and of Victoria $182 *per capita*. Unusual features of their governmental system make the Australians an interesting economic study. The larger part of the land is owned by the states; vast areas of grazing lands, for example, are merely leased to the tenants. The railroads, street cars, telephone and telegraph services, and other public utilities are managed by the Government and owned by the people, instead of being the property of corporations. The colonial governments incurred large debts to develop these and other conveniences, such as the building of deep-water docks, believing that the cost would be amply justified by the increased facilities for transacting business and accumulating wealth. The colonies became states (1901) in the Commonwealth of Australia, a federal government conducting its own affairs under the sovereignty of the United Kingdom.

of the far inland downs. Victoria is third in the quantity of wool, the product, however, being unsurpassed in the world for fineness and length of staple, on account of the quality of the grass and the drier air. A severe disadvantage in the sheep industry is the terrible droughts that sometimes kill the grass and dry up the streams, millions of sheep perishing in a few weeks.*

Large quantities of Australian wool are sent to all the great manufacturing countries. Nearly the entire crop is exported, the few woolen mills of Victoria and New South Wales having failed to reduce the growing imports of textiles to any appreciable extent. In the early days of the trade Australian wool could be purchased only at public sales in London; to-day many buyers, particularly from continental Europe, visit the markets at Sydney, Melbourne, Geelong, and Adelaide every year to make their purchases. In spite of the long-continued decline in the price of wool, the sales amounted in 1897, after years of severe droughts, to about $100,000,000, forty-three per cent of the sales being those of New South Wales.

Frozen meat and other animal products are large exports. Meat refrigeration was long neglected in Australia, though it had become a great business in New Zealand and Argentina. After 1892 Australia began to compete in this trade, and in 1896 it surpassed its competitors.† The business is confined to the four eastern states. It costs three cents a pound to kill, freeze, ship, and sell mutton in London. Only Queensland is prominent in exporting frozen beef.

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* Between 1894 and 1898 the sheep were reduced by droughts from 109,940,609 to 83,822,704. A rainfall of 10 inches per annum will support 10 sheep to the square mile; 13 inches, 20 sheep; 20 inches, 70 sheep.

† In 1896 Australia sent to England 2,385,736 frozen sheep carcasses, New Zealand 1,996,441, and Argentina 1,790,562. The Queensland shipments of frozen beef were counted in the Australian figures as four sheep for each beef carcass.

MEAT-PACKING INDUSTRY.

SWIFT & COMPANY'S PLANT, CHICAGO.

As that state is warmer and not so dry, it is more favorable for cattle than sheep; having more than half the cattle of Australia, it sells large quantities of frozen and salted beef, hides, and tallow. The dairying industry is most important in Victoria, butter being made in co-operative factories and large quantities sent to Great Britain,* South Africa, and other markets.

Most of the useful plants of all zones grow in Australia (Fig. 150). Cotton of good staple, grown in Queensland and northern New South Wales, is small in amount, but proves the practicability of cotton culture. The warm, moist coast district of north Queensland, especially around Cairns (Fig. 152), producing millions of bunches of bananas, supplies the Australian markets. Two crops of maize may be grown each year on the low coast lands of south Queensland, the grain thriving all along the sea border of this state. The Queensland sugar plantations, mainly north of the Tropic of Capricorn, between Mackay and Herberton, produce more than 100,000 tons of sugar a year, most of which is sold in the neighboring states. As Europeans can not work in these hot fields, natives of the Pacific islands, as well as Chinese and Japanese, are employed on the plantations. New South Wales also grows considerable cane in the north, preparing the product for market in its own refineries, which also treat considerable Queensland raw sugar.

Wheat and the grape are the main products on the cooler and drier farm lands of the south. The finest vineyards are around Albury, in New South Wales, though Victoria is now the chief vine-growing state. The grapes from many thousands of acres are turned into raisins. A large amount of claret and other wines is also made for

* The United States sells much less butter in England than is sold there by Victoria, which is a little larger than Minnesota and 11,000 miles from the British market.

home consumption and export. Many farmers have abandoned wheat-raising for the vine, grapes being in good seasons a more profitable crop. Most of the export wheat comes from South Australia, which gives more attention to this cereal than the other states. Australia is not a reliable contributor to the wheat supplies of importing countries, as short crops often result from severe droughts, and even in good years the yield per acre is not large. Irrigation, already much employed in Victoria and South Australia, will greatly extend the agricultural area.

All varieties of the useful eucalyptus tree abound (p. 108). As all native timber is hardwood, it is not well adapted for ordinary building purposes, and consequently a large amount of pine is imported from our Pacific coast, Sweden, and Canada. The superior hardwoods, jarrah for railroad ties and karri for wood paving, are exported.

The mineral wealth is enormous (Fig. 151). Gold is the largest mineral resource. It is attracting thousands of immigrants into West Australia, one of the greatest gold centers in the world. Nearly all the gold is minted at Melbourne or Sydney, and exported in sovereigns and half-sovereigns, a great deal coming to this country to settle trade balances. The larger part of the coal comes from the collieries around Newcastle and Lithgow, in New South Wales, which produce about 6,000,000 tons a year, exporting to south Asia and even to our Pacific coast. Tin is a large product, particularly of Tasmania. New South Wales is the only state having extensive beds of iron ore, but their development, thus far, has been small.

Manufactures are comparatively small.* There is as yet no development of any great branch of industry that is

* The facts presented in this volume have shown that only Europe, Asia, and the United States are pre-eminent in manufacturing pursuits. While the manufactures of Asia are largely inferior, judged by Western standards, they are adapted to the civilization of the Asiatic peoples, and, being enormously developed, Asia may be classed as one of the

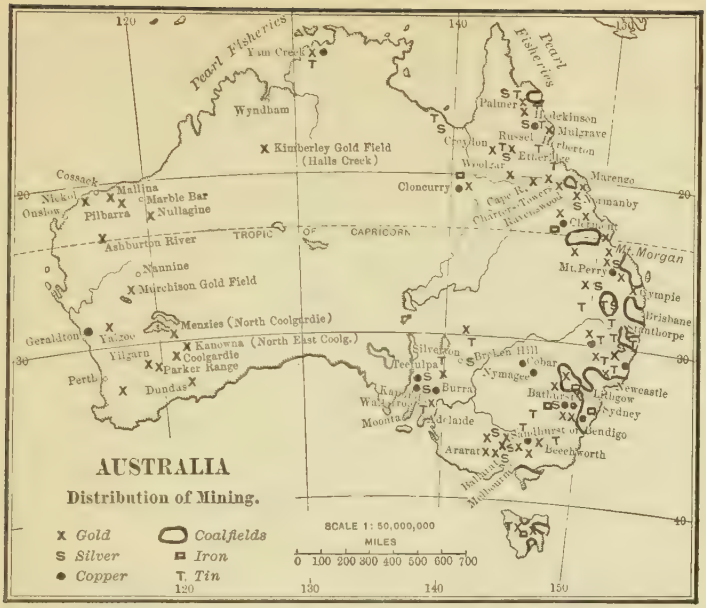


FIG. 151.—The gold mines in the desert of West Australia, from Kimberley to Dundas, are supplying (1901) more than half the Australian output. The treasure these desert sands concealed was unknown in 1885. The wonderful development of these diggings placed Australia second in the list of gold producers in 1899, being surpassed only by the South African Republic (compare Fig. 68). South Australia is famous for its copper mines. Wallaroo and Moonta have the largest copper and silver smelting works in Australia. Gold has contributed most to the prosperity of the small state of Victoria, which is the most densely peopled part of the continent. The most productive mines are around Ballarat and Sandhurst. The larger state of New South Wales is not so prominent in gold mining, but it has at Broken Hill one of the richest silver mines in the world, the output being exported through South Australia, as Port Pirie (Fig. 152) is the nearest seaport. Silver mining has decreased in the past few years on account of the low price of the metal. Queensland is the third of the great gold-producing states, with three conspicuous centers. The richest is in the north, with Charters Towers and Ravenswood as the leading centers. Farther south the Mount Morgan mine is one of the richest in the world, being practically a mass of solid gold ore. Its profits have amounted to about $24,000,000 since 1885. Gympie is the southern center of the gold industry. The great tin formation, beginning in the Straits Settlements and extending through Banka and Billiton, is continued among the islands through Australia and into Tasmania. The deposits are chiefly worked at Herberton and Stanthorpe in Queensland, in northern New South Wales, and form the main wealth of Tasmania (Fig. 66), where the ores are smelted at Launceston (Fig. 152) with coal mined in the island. Good coal exists in great abundance on the east coast. Being near the sea, it may easily be carried to the other coasts which lack coal. Sydney has the great advantage of coal both to the north and south of it. The pearl fisheries of the north yield mother-of-pearl and some pearls.

capable of supplying the needs of the country. The textile, metal, glass, and china industries are especially insignificant. Still, the predominant British population is ambitious to develop on a large scale the manufacture of their abundant raw materials. In the neighborhood of the larger cities, accordingly, there are well-equipped establishments for making agricultural and other machinery, tanneries, soap and candle works, woolen, flour, and saw mills, breweries, and sugar and brandy factories. Native skins and furs are manufactured also, and shipyards turn out an important tonnage of small vessels. Until manufactures have far greater expansion, however, the imports will continue to consist mainly of the industrial products of other countries.

Railroads are rapidly developing (Fig. 152). Victoria, the smallest state, is more amply provided than any other, with lines traversing all parts of it. South Australia has far advanced the line that is to cross the continent from south to north. West Australia is pushing lines far out into the desert to the new gold fields. The disadvantage of the railroad system is that each colony adopted its own gauge, so that freight and passengers must still be transferred to other trains at the frontiers of the states.

Most exports are raw products, and most imports are manufactured commodities. Few countries have equaled Australia in rapid growth of foreign trade.* Most of the total trade is with the United Kingdom and the other

two great manufacturing continents. The rest of the world consists of colonies which depend chiefly upon the mother countries and other lands for the larger part of their manufactures; former colonies, now independent, which are not yet able to supply their need for manufactured commodities without large imports; and regions inhabited by primitive races which still occupy a low plane of development.

* The total foreign trade of the colonies in 1825 was $2,500,000; 1851, $44,800,000; 1871, $345,500,000; 1897, $563,800,000. The trade of the Australian colonies with one another has always been counted as foreign trade.

FIG. 152.—The east coast is more favorable for commerce than the others. It is protected for more than 1,000 miles by the Great Barrier Reef. It has the largest number of railroads, bringing the resources of the interior within easy reach of the ports. Cooktown, the most northern harbor on the east coast, is the outlet for many rice and sugar plantations and the Palmer gold field. Cairns ships the large tin output of Herberton and many cargoes of bananas. Long lines of railroad extend inland from Townsville, Rockhampton, and Brisbane. Townsville monopolizes the gold trade of the famous Charters Towers and Ravenswood mines. The railroad from Rockhampton taps the large gold and cattle trade of central Queensland. Brisbane commands the coal and wool trade of south Queensland. Newcastle, the largest coal port in the southern hemisphere, depends upon the coal mines within a radius of 30 miles around it. Sydney, with over 100 miles of water front along its splendid bay, is the terminus (1910) of all steamship lines between Europe and Australia.

The west half of the south coast has no harbor except Albany, a port of call for steamers from Suez with freight for the west coast to be forwarded by rail. Port Pirie and Port Augusta are important harbors on Spencer Gulf. Port Pirie is one of the largest wheat ports and a supply depot for the silver mines at Broken Hill and Silverton. Port Augusta is the outlet for the pastoral regions west and the wheat lands northeast of it. Adelaide, the outlet of a fine agricultural region, has a harbor that may be entered by the largest vessels in any weather. Melbourne, the largest city of the Commonwealth, on the river Yarra, has a commodious harbor; vessels of 8,000 tons may ascend the Yarra to the heart of the city, which handles nine tenths of the foreign trade of Victoria.

Fremantle, the most important port on the west coast, is connected with the eastern ports by coasting vessels, and with Perth, the capital of Western Australia, by river and rail. Geraldton is the port of the rich Murchison gold field and of the large pastoral district to the east, from which thousands of bales of wool are exported. The best north coast harbor is Port Darwin, the outlet of the neighboring gold and tin mines. Palmerston is important as the terminus of the overland telegraph, and the starting point of one of the two cable lines to Java and Europe. The overland railroad from Adelaide to Palmerston has nearly reached the center of the continent.

British colonies, the non-British imports in 1897 amounting to only about 15 per cent and the exports to 18 per cent. The trade with the United States and Germany, both of which have regular steamship communications with Australia, is growing rapidly. The most important exports are wool, hides and skins, frozen and preserved meats, butter and cheese, gold and other metals, wheat and flour. The principal imports are textiles and other manufactures, tea, coffee, and sugar. The United States buys from Australia a great deal of wool, gums, hides and skins, copper, and considerable coal; it sells to Australia petroleum, railroad cars, tobacco, hardware, machinery, leather goods, and other articles worth five times the amount of its purchases from that continent.

STATISTICS FOR AUSTRALIA

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS)

	1881–'85.	1891–'95.	1899.	1901.*	1902.	1908.
Imports.....	231.6	262.7	308.7	201.1	203.6	242.3
Exports.....	226.6	279.4	374.1	223.4	213.7	302.3

Population (1908, estimated), 4,275,000.

British coinage, weights, and measures.

* The large decline in trade is due to several years of drought from which the Commonwealth suffered severely.

NOTE

Reasons why Australian wool can be transported half way around the world and compete in price successfully with the wools of Europe are that sheep are on the pastures all the year, saving the cost of winter feeding, and that the grazing lands are very cheap.

CHAPTER XLIII

NEW ZEALAND

New Zealand is a striking example of successful colonization (Fig. 153). Somewhat smaller than Italy, and with a population of less than 1,000,000, it has over 11,000,000 acres of land under cultivation. Twenty-two million sheep supply European countries with wool and mutton, and 250 butter and cheese factories send their products 10,000 miles to market. Fine forests, rich coal fields, and gold mines also abound. The prosperous inhabitants sell every year over $70,000,000 of their products to other countries.

The warm and constant westerly winds, "roaring forties," give the islands a mild and equable climate. As they deposit most of their moisture on the lofty mountains of the west coast there is not too much rainfall for sheep pasturage on the plains of the east, though sufficient for the best farming.

The east side of New Zealand is most important for grazing, farming, and commerce; the west side for forest industries. There are no important harbors on the mountainous west coast. The east coast has four fine harbors, two on each island, besides others of importance in the coasting trade. Port Chalmers, the harbor for large vessels of Dunedin, has both water and rail connections with that city, which itself accommodates steamers of eighteen feet draft. Dunedin, the outlet for the gold mines in the river valleys among the mountains, is a very busy city, whose woolen, machinery, and other manufactures have been stimulated by the coal on both sides of it. Lyttelton

(Fig. 18), the port of Christchurch, the second largest city, is a commodious and busy harbor, its prosperity being due to the fact that it stands on the rich Canterbury Plain, where the largest agriculture and sheep-growing are centered. This plain, about 160 miles long and 30 miles wide, has a comparatively dense population, whose commercial interests are centered at Christchurch.

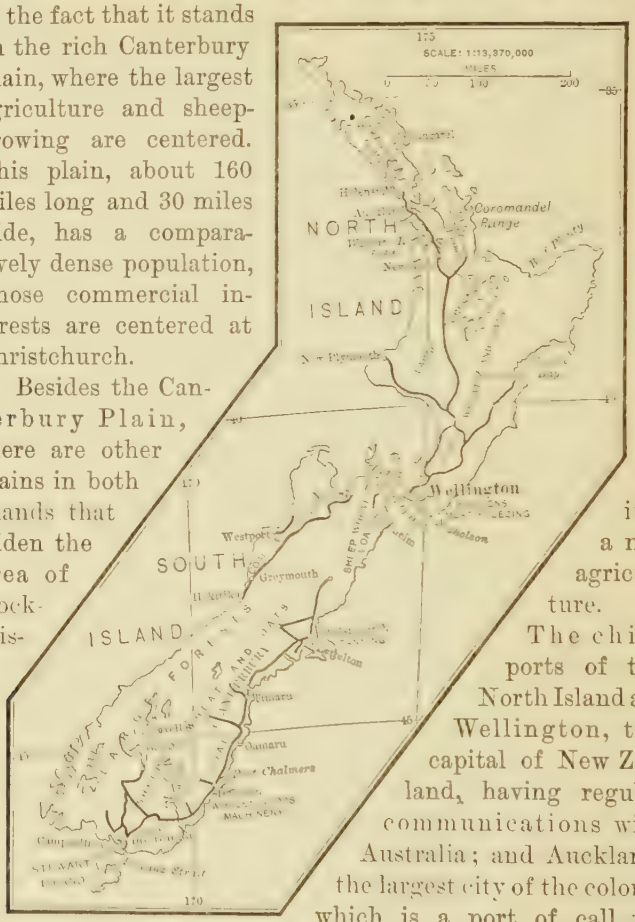


Fig. 158.—New Zealand.

Besides the Canterbury Plain, there are other plains in both islands that widen the area of stock-raising and agriculture.

The chief ports of the North Island are Wellington, the capital of New Zealand, having regular communications with Australia; and Auckland, the largest city of the colony, which is a port of call for steamships in the American-Australian trade. Among the smaller ports Oamaru is important as an outlet for the wheat region, and Timaru for frozen meat.

Sheep-raising is the chief industry. Animals and their products are more than three fifths of the exports, wool is nearly two fifths, the business of freezing and exporting mutton and beef being also very large. Nearly all the by-products—bones and bone ash, hides, hair, hoofs, horns, and some of the leather—are exported, and the waste is converted into fertilizers. New Zealand mutton is regarded as the best that is sent to England. Cattle are of subordinate importance as compared with sheep, though some frozen beef, and enormous quantities of butter and cheese, of excellent quality, are exported. The dairy products are made in factories on the co-operative plan, as in Denmark, insuring an output of a high and uniform grade.

Agriculture is next in importance. Wheat and oats are the principal crops, thriving best in the South Island, though also grown in the North Island. Wheat and flour are considerable exports. As all the pasture lands are sown with English grasses the sale of grass seeds to Australia yields a substantial income. Fine apples and peaches are among the fruits.

One of the characteristic products is New Zealand flax, or phormium (p. 103), growing wild in the valley of the Waikato River, the exports varying according to the extent of the marshes, due to the river's overflow, in which the plant grows. Another distinctive product of the North Island is the tall kauri pine, yielding not only fine timber, but also the kauri gum of commerce. The chief supplies of the gum which is used in making varnish (exported to the value of about $2,000,000 a year), come from the fossil stores dug from the soil in which kauri forests once grew, some of the masses of gum weighing 100 pounds each. Native barks are employed in the important tanning industry, tanekaka bark being also exported to France for dyeing kid gloves. The other forest resources are very valuable, the colony manufacturing its own lumber.

Coal and gold are the only important minerals. The situation of the mines is shown in Fig. 153. Practically all the

gold, to the amount of about $5,000,000 a year, is exported, most of it being found in proximity to the coal. The coal mined, about 800,000 tons annually, is not sufficient for home uses, and is supplemented by imports from New South Wales. Coal-mining is increasing, and may yet supply the local demand. The coal of the northwest part of South Island is shipped from Westport and Greymouth to other districts in the colony. The coal of the southeast is conveniently situated for shipment by rail.

Manufactures are growing. Industrial development is stimulated by the supply of good coal near at hand. Wool-scouring and meat-preserving give employment to many persons. Other industries supply wholly or in part the demand for boots and shoes, woolen goods, brick, tile, furniture, lumber, beer, flour, and foundry iron. The distillation of spirituous liquors is prohibited. Considerable machinery is made. Most manufactures are protected by a high tariff.

Three fourths of the trade is with Great Britain; most of the remainder is with Australia, India, and Fiji. The trade with the United States is about one sixteenth of the total foreign commerce. The largest imports are clothing and textiles, iron and steel goods, paper and stationery, sugar, and spirits. The leading exports are wool, frozen meat, gold, butter and cheese, kauri gum, grain, flour, and tallow.

STATISTICS FOR NEW ZEALAND

AVERAGE ANNUAL TRADE (IN MILLION DOLLARS)

	1881–'85.	1891–'95.	1899.	1902.	1904.
Imports	39.1	32.8	42.5	55.1	49.8
Exports	33.7	46.1	58.0	66.4	51.8

Population, 815,616.

British coinage, weights, and measures.

CHAPTER XLIV

OCEANIA

The island groups of the Pacific have a growing trade with the rest of the world. Their commercial development, though still small, except in the territory of Hawaii (pp. 170–173), has been stimulated by the fact that they have all come under the dominion of various European powers and the United States, so that more white traders and planters are settling in them. They have tropical and some mineral products of much value in the world's markets, besides food plants of especial importance in the nourishment of the islanders.*

* Observe the wide range (Fig. 35) around the world, on both sides of the equator, of the cocoanut palm. The lines bounding its habitat, north and south, are not extended across the continents, because this palm loves the sea and does not thrive far from it. It fringes all the tropical islands of the Pacific, where it is found in its greatest perfection. The nut is a large part of the food of millions of people in the East Indies and the Pacific; from it and other products of the tree they make their dwellings, boats, mattresses, and fertilizers for their fields. The Tahiti and Marshall groups alone send about 1,000,000 nuts a year to San Francisco. Most of the imports are desiccated, shredded, and sold to bakers and confectioners. Copra is the meat of the cocoanut, dried in the sun, and sent chiefly to Marseilles, but also to Liverpool, San Francisco, and other ports, where the oil is expressed and used in the manufacture of common and medium-grade soaps. About 8,000 nuts make a ton of copra. Breadfruit is the fruit of a tree of the nettle family, and a large article of food in the South Seas (Fig. 43). When roasted it has some similarity to fresh bread. Fig. 43 also shows the habitat of the sago palm and the banana. Sago is a farinaceous food prepared from the soft inner portion of the sago

The largest island of Melanesia is New Guinea.* It is the second largest island in the world. Its development is only just beginning. Europeans are working the alluvial gold deposits in British New Guinea; the pearl and pearl-shell fisheries and bêche-de-mer are also important in trade, which is mostly with Queensland and New South Wales, and amounts to about $500,000 a year. German New Guinea (Kaiser Wilhelms Land) has cotton and tobacco plantations, opened by the German New Guinea Company, the product being sent to Bremen. Laborers are brought from Java and China to work these plantations, and many natives have now been trained to labor. A number of trading stations on the coasts of Dutch New Guinea are visited by vessels to collect their stores of bêche-de-mer, nutmegs, tortoise and pearl shell, and birds-of-paradise feathers. New Guinea is one of the least known parts of the world; little use is yet made of its varied resources.

New Caledonia, whose development is retarded by its being a French penal colony, is exceptionally rich in minerals and metals. It is one of the largest sources of supply of nickel and cobalt. Coffee is also exported. Noumea, the capital, has a good harbor, and cable and steamship connections with the rest of the world (Figs. 1, 6).

The New Hebrides (French) have a considerable trade in fish, copra, pearl and tortoise shell, bêche-de-mer, and bananas, French and Australian syndicates controlling the business. The islands have long been an important source of native labor (kanakas) imported to Queensland for the sugar plantations.

The Solomon islands (German in the north, British in the south) give great opportunity for the copra industry.

palm, and is a staple article of diet in the hundreds of islands where it grows. It is used in countries that import it as a table delicacy or dessert. The banana is most largely used as food in tropical Africa, where it is the main support of millions of people.

* Refer to Fig. 20 for this chapter, unless otherwise directed.

British firms engaged in copra drying send their product in small vessels to central stations to await the arrival of a ship from Sydney. These islands are still little known.

The Fiji Islands are the most thriving colony among the South Pacific groups. Sandalwood first attracted traders to the islands early in the last century. Eleven hundred miles from New Zealand and 2,000 from the coast of Australia, close trade relations are maintained with those countries. Sugar, copra, and fruit, chiefly bananas, are the most important export products. The sugar interests, largely in the hands of one company, extend over a number of the islands, and supply all the home demand and the greater part of the exports. Copra is next in importance. Bananas, among the finest in the world, are sent to New Zealand and Australian markets. Two to three crops of maize are annually harvested. The natives make good plantation hands, but the demand for labor exceeding the supply, many coolies from India have been brought into the country. Suva, the capital, and Levuka have good harbors, and are both commercially important. The exports exceed the imports, which consist of cotton goods, machinery, hardware, and foodstuffs. The trade is almost entirely with the Australasian colonies and the United Kingdom.*

The Samoan group is a German possession, excepting Tutuila and the little Manua islands, which belong to the United States (p. 173). German planters have long had the largest interests in the islands. There are no habitations more than four miles from the coasts. Kanaka labor is imported from other islands, as the Samoans will not work on the plantations. Copra is the largest export, cacao, bananas, pineapples, and limes being also sold. Clothing, provisions, and kerosene are the chief imports. The trade is chiefly with the Australasian colonies, Germany, the

* Imports (1906), $3,313,270; exports, $4,391,970.

United States, and Great Britain. Apia, noted for its destructive hurricanes, and Pago-Pago (U. S.) are the best harbors.

The Friendly Islands (Tonga group), the last to be placed under the protection of a foreign power (British), are between Fiji and Samoa, and have a very small foreign trade. They sell most of their copra to Germany, and buy their cloth and foodstuffs in New Zealand.

The Society Islands (Tahiti), east of Samoa, belong to France, but nearly half of the total trade is with the United States, San Francisco being the nearest market in which to buy flour and textiles, and having frequent communications with the group. Copra, vanilla, and mother-of-pearl are the chief exports.

The Marshall Islands export copra and cocoanuts, most of the business being in the hands of the Jaluit Company. The Caroline Islands, recently ceded with the Ladrones by Spain to Germany, are an extensive archipelago of small islands, with considerable trade in copra.

This brief survey of the more important Pacific groups shows that their principal export is copra. The total trade of all of them is not equal to that of the Hawaiian group (p. 181), which has the advantage of a cooler climate and high civilization. The resources of these islands are very great, though as yet little use has been made of them.

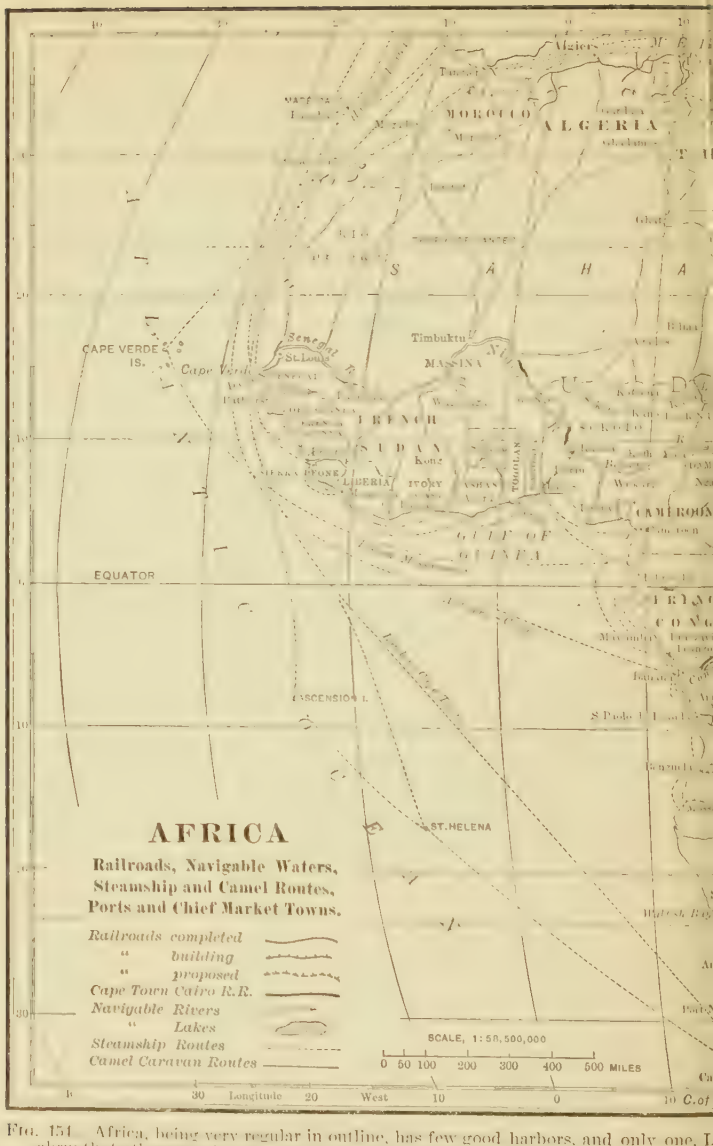
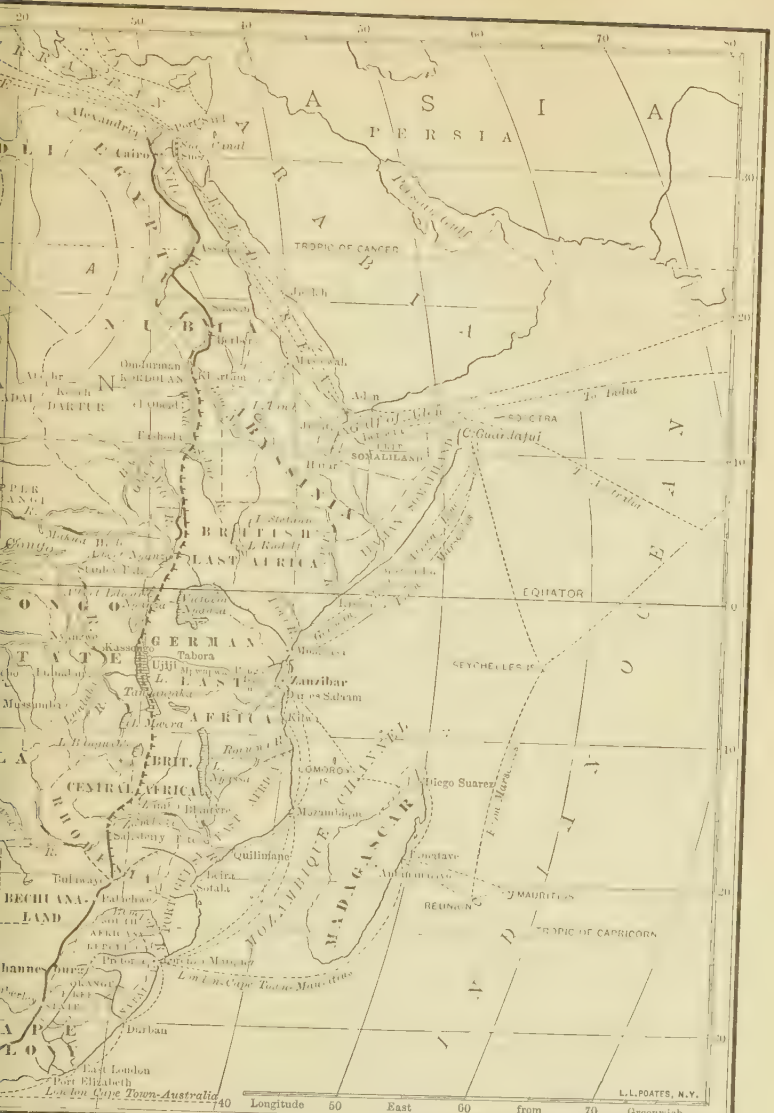


FIG. 151. Africa, being very regular in outline, has few good harbors, and only one, I abruptly to the coastal plain, the rivers are interrupted by rapids along the edges of are an impediment to commerce. The only very important reaches of unbroken na therefore most essential to development. Egypt, Tunis, Algeria, and South Africa from the coasts to the inland regions; also the route of the partly completed transc hara, connecting the Sudan with the Mediterranean; also the numerous large and nas stations at many ports from Port Said to Cape Town. The west coast cable about 200 miles south of Lake Bangweolo and a branch of it has now been extended



nez. of the first class. Most of the continent being a high table-land descending rather
teau, so that none of them is easily navigable from the sea to the far interior. These facts
the sea are on the Nile and on the Niger and its Benue tributary to Yola. Railroads are
vanced railroad systems. The map shows many lines completed, in progress, or projected,
e from Cape Town to Alexandria. Observe the many camel-caravan routes across the Sa-
which are terminal or calling ports for many steamship lines. The east coast cable line
as far south as S. Paolo de Loanda. The Cape to Cairo R. R. was completed (1907) to
r fields of the Belgian Congo.

CHAPTER XLV

EGYPT AND NORTH AFRICA

The Nile gives life and commercial value to Egypt. Excluding its enormous deserts, Egypt has an area only as large as New Hampshire, enriched by mud which the annual floods of the Nile spread over it. Over 9,000,000 people are densely distributed over the Nile delta and the river banks, which in the summer season benefit by the floods. The White Nile (Fig. 154) swells their volume, but the Blue Nile and the Atbara, north of it, bring the fertilizing silt from the mountains of Abyssinia.* Though tributary to Turkey, British influence—paramount in Egypt—has contributed much to its recent rapid progress.

Three fifths of the population are farmers. Though the climate is warm, temperate as well as subtropical crops are raised. Cotton is the great export crop, being about three fourths of all the exports. A French botanist, in 1821, found a few plants growing wild in Cairo, with a long staple fiber, which he recognized as cotton of exceptionally fine quality. The result of this discovery was the development of cotton-planting, which was rapidly extended as manufacturing countries came to know the merits of the

* A very large dam was completed (1903) across the Nile, at Assuan, to impound a part of the flood waters that run to waste in the months of inundation. This surplus water will be reserved for the months of the low Nile (our winter months), and will then be turned into the irrigation canals; thus the fields that may be irrigated the year round will be widely extended.

fiber. Most of it is raised in the delta, but the region south of Cairo also produces a considerable quantity. Practically the entire crop, about one tenth as large as that of the United States (Fig. 52), is exported, finding a quick market, at good prices, in the United States (p. 95) and in the leading countries of Europe. Half of it is sold to England. Marseilles buys most of the cotton seed.

Cereals and vegetables are nearly a fifth of the exports. Rice thrives in the delta; wheat is a still larger crop, occupying a third of the delta and half of the farm lands south of it; maize is also one of the large food crops. Much rice is imported, but surplus wheat and maize are sent to Europe, as are beans, used in England as horse feed. Cane sugar is sent refined to the markets of the Levant, where it competes with other sugars. Tobacco is one of the largest agricultural imports. The cultivation of tobacco in Egypt was prohibited in 1890, because some manufacturers of the famous Egyptian cigarettes were mixing inferior home tobacco with imported Turkish leaf, thereby imperiling the foreign trade—a source of large Government revenue through the export tax.* Egyptian onions have a prominent part in trade, going to the United States as well as to several European countries.

Sheep and goats, supplying skins, are a source of wealth, but the imports of animal products are much larger than the exports. As industries have small development, textiles (more than a fourth of the whole imports), hardware and machinery, glass, chemicals, and other manufactures are large imports. As Egypt has no timber, Scandinavia, Hungary, and other countries supply a large amount of lumber, and England sends coal. The magnitude of the

* Most of the genuine "Egyptian" cigarettes in the export trade are made in Cairo by Grecian workmen, using Turkish tobacco and paper manufactured in Germany, Austria, or Italy. Many of the cigarettes consumed in the country are made of cheaper tobacco by native workmen.

cotton exports, however, almost invariably turn the balance of trade in favor of Egypt. Our purchases of Egyptian cotton are worth two or three times as much as our sales to that country.*

Tripoli has the largest caravan trade with the Sudan. Its coast line being nearer to the Sudan than any other part of the Mediterranean littoral, and wells being most numerous along the western desert routes, Tripoli has the best advantages for caravan trade. Several great caravans, numbering as many as 9,000 camels, cross the desert every year to Lake Chad and Timbuktu (Fig. 154), carrying textiles from England, weapons, tools, and hardware from Germany, glassware from Italy, and sugar and many small articles from France. They return with ostrich feathers, ivory, gold dust, tanned hides, and some slaves—a traffic now prohibited, but surreptitiously carried on to some extent. Most of Tripoli is a sandy waste, interspersed with fertile oases, producing dates. The imports are manufactures, many of them purchased for barter in the Sudan and desert trade. The exports include commodities from the Sudan; esparto, the largest export, growing on the moorlands of the coast; sponges, from the rich fisheries along the coast; barley, the most important cereal; madder, for dyeing; henna leaves, used in cosmetic preparations; eggs, sent in

* Fig. 154 shows the most important railroad connection between the Suez Canal and the Nile. A network of railroads covers the delta. The Nile Railroad has been extended to Khartum, the capital of the Egyptian Sudan, ruined by the Mahdist tyranny. Khartum was formerly the trade center between Cairo, Suakin, and the upper Nile regions. Its favorable position will again make the rebuilt city important in trade. Alexandria, the largest port and commercial city, has a movement of over 2,000,000 tons a year—about one fifth as much as passes through the Suez Canal. Cairo, the largest city in Africa, at the junction of the delta and the valley, is the political center, the seat of the tobacco industry, and derives large profit from the winter tourist traffic. Suakin is a Red Sea forwarding port. A railroad was completed (1906) from the Nile to Port Sudan, a new port north of Suakin.

large numbers to Malta; and a few horses and cattle of the littoral. As the city of Tripoli has a fair harbor, the caravan routes converge there. Turkish influences prevail, and Tripoli is far behind the neighboring countries.

Algeria is the most important colony of France (Fig. 155). The political and business relations of the mother country with Algiers are very close, the colony's senators and deputies having an equal voice with those of France in parliament, and over five sixths of the exterior trade being with France. It is pre-eminently an agricultural country and a prosperous colony, though it suffers from droughts and the lack of navigable rivers. Algeria is France's mainstay for all kinds of early vegetables, including enormous quantities of potatoes, which are carried on fast steamers to Marseilles. The green produce, leaving Algiers at noon, is unloaded at Marseilles in the afternoon of the next day, starts on the evening trains for Lyons and Paris, and is for sale in the Paris markets from 35 to 40 hours after leaving Africa. Tobacco is one of the most remunerative crops, France's imports from Hungary and other countries having been largely reduced since Algeria became a source of supply. A part of the wheat and barley harvest is exported, the wheat being particularly rich in gluten, and therefore desired by makers of alimentary pastes. Flax succeeds well, but is a minor industry. Olives and oil seeds are large crops, very convenient to the Marseilles market, the largest buyer of these commodities.

Algeria is one of the greatest wine producers, the vine thriving everywhere. France buys the large variety of wines exported, mixing them with French wines. Large cork forests supply much of the cork of commerce. Millions of sheep and goats find ample pasturage on the high plateaus of the south, and exports of wool and skins are large. Esparto is a great natural resource, to be had for the gathering. The oases on the edge of the Sahara, with their groves of date palms, watered from artesian wells, make

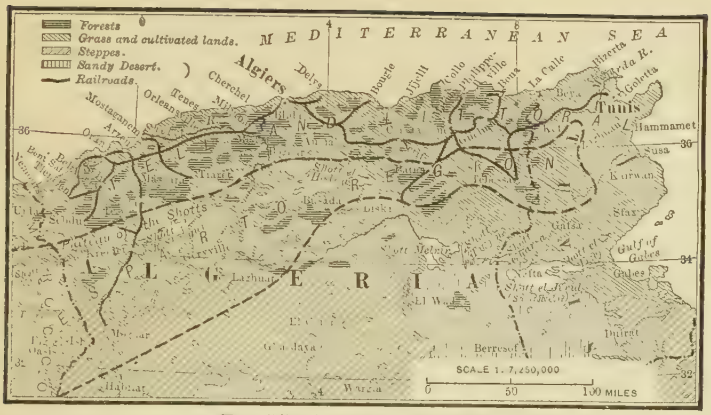


FIG. 155.—ALGERIA AND TUNIS.

ALGERIA.—Algiers, the capital and chief port, has a fine artificial harbor (Fig. 12), the fastest steamship connections with Marseilles, and exports more vegetables, tobacco, flax, wine, and sheep than any other port. Its great commercial advantages are its central position on the coast and the shortest sea route to Marseilles. Oran, with two thirds as much foreign trade as Algiers, leads in exports of esparto, tanning barks, and cereals. Philippeville and Bona, in the east, with nearly as much trade together as that of Algiers, export half of the wool, fish, and fresh and dried fruits, and the larger part of the olive oil and cork wood. Mostaganem, near Oran, though an open roadstead, has considerable trade. Beni Saf is the port for the rich iron ores of the northwest. The Tell and littoral, the rich cultivated strip between the Atlas Mountains and the coast, are covered with agricultural villages, and yield the wheat, barley, tobacco, olives, grapes, and other fruits forming a large part of the wealth of the country. The Tell extends from 50 to 150 miles inland. Only the finest forest areas are shown on this map; they are mainly on the slopes of the Atlas. The vast area included between broken lines shows the high drier regions, where esparto (alfa) grows wild. It is exported mainly to French paper mills and England, but would supply a large part of the paper stock of the world if wood pulp were not generally in use. Sheep and goats in great numbers graze on the succulent herbs of this region, supplying the wool and skins that are important in the exports. On the edge of the desert, reached by the railroad at Biskra, are irrigated oases growing millions of date palms.

TUNIS.—The Tell, with its characteristic products, extends through the north part of Tunis. The French have cut a deep channel through the salt lake between Goletta and Tunis, the capital, making Tunis a maritime port. Bizerta is also an important port and a French naval station. Susa and Sfax, on the east coast, export esparto and cork. A railroad has been built (1900) between Sfax and Gafsa to the rich phosphate beds extending into Algeria, making that region the largest source of phosphate, excepting our southeastern states.

Algeria one of the leading exporters of dates.* Iron ore, found in the northwest, is sent to France; extensive phosphate beds in the southeast are as yet little developed.

Algeria is tributary to France for nearly all its manufactures. The Arabs make cloths, carpets, and jewelry that have considerable foreign sale. Along the coast and in the Tell are flour mills, oil refineries, factories for making alimentary pastes, sardine canneries, and cork-working establishments. As the colony lacks coal, it can not advantageously attempt the manufacture of many articles that may cheaply be procured from France.

The exterior trade has been almost steadily increasing for many years, with the development of agriculture and stock-raising, under the French régime. The largest exports are tobacco, cereals, esparto, wine, iron ore, cork, and vegetables. The most important imports are general manufactures, coal, and colonial products (coffee, tea, and spices). The United States has very little share in the trade.

Tunis has made great progress under the French protectorate. Twenty years ago, under the Turkish régime, life and property were insecure, there were no roads, and Tunis, the capital, could not be reached by ocean vessels. It is now safe to engage in enterprises and to accumulate property; all towns are connected by roads; railroads have been built. Tunis is a seaport, and agriculture, the largest interest, has developed. Physically, Tunis is a prolongation of Algeria to the east (Fig. 155). The soil of the Tell is rich,

* The date (Fig. 43) is a very large product of North Africa, Arabia, and Persia, where it is a leading article of food. It is grown successfully in California. Biskra is the great market in Algeria, the fruit from several oases being sent there to be packed. Some varieties are sent to Europe and America for eating or sirups, and others are retained for the food supply of the Arabs. The export crop is purchased by wholesale buyers at Biskra and shipped to Marseilles, where it is reinspected and repacked for the trade.

producing cereals, olive oil, and wine for export. The olive oil of the Tell and the dates of the oases are regarded as the best in the world. Esparto is gathered on the southern plateaus. The fisheries are particularly rich, and the yield of sponges is important. Carpet-weaving is the only considerable industry. Three fifths of the trade is with France and Algeria, England and Malta having an eighth of it and Italy a tenth.

Commerce has little development in Morocco (Fig. 154). Its stagnant, poverty-stricken condition is due to misgovernment from the time the Moors were expelled from Spain. Morocco is still steeped in barbarism, though it is nearer to Europe than any other part of Africa. With a fine climate, good soil, and great natural riches, it is governed by an absolute sultan, its people are fanatical Mohammedans, and white men are not safe in most parts of the land. Very little European influence has been used to improve these conditions.* There are no railroads, no roads except mule and camel paths. Mining is absolutely prohibited. Tangier, Mogador, and a few smaller ports are open to foreign trade, which is very small in proportion to the extent and value of the country. The city of Morocco has caravan communications with Timbuktu on the Niger, bringing from the Sudan ivory, gold dust, and ostrich feathers, besides large quantities of dates from an oasis in the Tafilet district of the Sahara. The imports are cottons, silks, hardware, candles, and petroleum. The chief exports are beans, cattle, wool, goatskins, eggs, and wax. England sends about three fifths of the imports and takes a fourth of the exports. Petroleum is the American prod-

* Morocco is an illustration of the fact that political jealousy sometimes retards commercial development. None of the great European powers is willing that any of its rivals should gain political or commercial ascendency in Morocco. That country, therefore, has been let alone. But in 1906 France and Spain were authorized to help Morocco to keep order and promote commerce.

uct most used. Goatskins are the only considerable export to this country.*

STATISTICS FOR NORTH AFRICA

Egypt

Average Annual Trade (in Million Dollars)

	1881–'85.	1891–'95.	1899.	1901.	1908.
Imports	40.0	45.0	56.6	75.4	119.8
Exports	61.0	63.5	75.9	77.8	103.5

Population (Lower and Upper Egypt, 1908), 11,287,000.

Gold is the monetary standard, with the pound (100 piasters, worth $\$4.94\frac{1}{3}$) as the unit of coinage. Metric weights and measures, but local denominations also employed.

Tripoli

	Imports.	Exports.
Trade in 1908	$1,650,000	$1,150,000

Population (estimated), 600,000.

Algeria

Average Annual Trade (in Million Dollars)

	1881–'85.	1891–'95.	1899.	1908.
Imports	62.0	46.0	65.8	92.1
Exports	29.5	51.0	66.7	65.1

Population, 5,231,000.

French coinage, weights, and measures.

Tunis

Average Annual Trade (in Million Dollars)

	1896–'97.	1898.	1902.	1908.
Imports	9.2	10.3	10.8	24.6
Exports	7.1	8.5	7.8	18.8

Population, about 1,500,000.

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* Gibraltar, at the entrance to the Mediterranean from the Atlantic, and Malta, between Sicily and Africa, are military and naval stations of Great Britain, maintained to secure the route through the Mediterranean to India, and important also as coaling stations.

CHAPTER XLVI

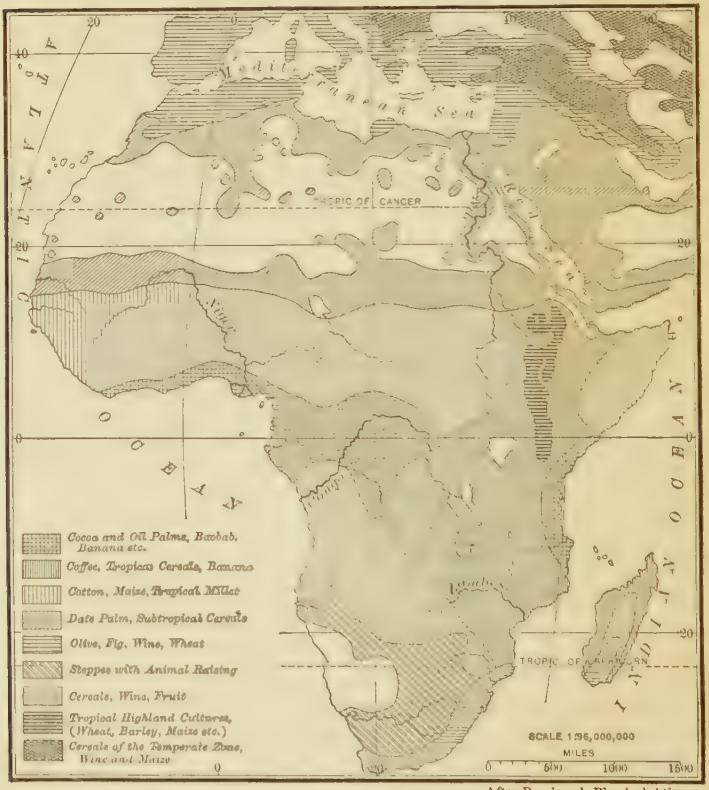
TROPICAL AFRICA

Underground waters give commercial value to the Sahara (Fig. 154). This greatest desert in the world, four fifths as large as the United States, is a barren waste simply because the drying winds from south Europe bring very little rain. The soil lacks no element of fertility save moisture. Only one river, the Nile, crosses the desert, which is turned into a garden along the great water way. The Sahara, however, does not lack underground water courses; wherever they come to light in natural depressions (wells), or are reached by boring, the surrounding lands are turned into oases, date palms and cereals are raised, and thus food is provided for thousands of persons. Without these oases the present desert traffic could not exist, nor could there be the commercial highways across the desert indicated in Fig. 154. New wells are adding to the tilled area yearly.

The desert gradually merges in the fertile lands of the Sudan, across the northern half of which is a region of date palms and subtropical cereals (Fig. 156). This is a region of comparatively dense population, a mixture of Hamitic, Semitic, and Negro peoples (Fig. 19), many of whom are clad in the cotton cloths which they manufacture or buy from the caravans and are skilled in leather work and other industries. They have many horses and cattle, and important trade among themselves. They are now under British and French dominion. Though fanatical Mohammedans, they are yielding, particularly in the Lake Chad

region, to European influence, and trade with them promises to become important.

South of this region is a broad belt, distinguished in Fig. 156 as a land of cotton, maize, and tropical millet.



After Berghaus's Physical Atlas.

Fig. 156.—Agriculture in Africa.

Horses gradually disappear in this belt, and are not seen again till South Africa is reached. Cattle also disappear, except in East Africa. Cotton is nowhere an important crop in Africa except in Egypt, but its future possibilities are

very great. This region, except along the west coast and the Niger and Nile rivers, is now less influenced by foreign commerce than almost any other part of Africa.

Farther south is a large region of cocoanut palms near the sea; of the oil palm, extending from the coast far into the interior; of the baobab tree and the banana. This is the district, from the Gulf of Guinea to the Upper Congo, that produces most of the palm oil from the fruit of the oil palm, sent to Marseilles and other centers for the manufacture of soap and candles; and palm kernels, from which the oil is expressed; and also the groundnut (peanut, but richer in oil than our peanut), sent in large quantities to Europe, and valued chiefly for its oil. This also is a part of the habitat of the kola nut, exported for medical uses, a large article of commerce throughout tropical Africa, where its stimulating qualities are valued. From this area comes most of the African rubber, procured from various vines, which have been so ruthlessly destroyed by native collectors that they can scarcely be found within forty miles of the coast. The baobab tree, under whose bark is a fiber useful in paper-making, is the giant of African vegetation. The banana is a large article of food wherever it grows, but foreign markets have nearer sources of supply.

South of the Congo is another large region of cotton, maize, and tropical millet, which is important in commerce along the Portuguese coast. Observe the great sheep-raising steppes of South Africa; the west coast area of aridity, in German Southwest Africa, where the winds from the Indian Ocean have lost most of their moisture before they reach this region; observe also the wheat and vine lands of South Africa.

On the east side of the continent is a wide area where coffee, tropical cereals, and the banana are characteristic plants. At the south end of Lake Nyassa coffee, which brings a high price in the London market, is now raised. Near the coast is a narrow belt where the oil palm again

enters into trade. The northeastern projection of Africa, south of the Red Sea, has small part in commerce, except along the coasts. West of it are the highlands of Abyssinia and the plateau region south of them (tropical highland cultures), which promise to be of much future importance. In this region and a little east of it are large numbers of cattle, the main food of many of the people.

The rude native hoe is the agricultural implement throughout tropical Africa. The type of tillage may be distinguished as hoe culture, just as we speak of the garden culture of China, the agriculture of this country, and the planting industry in the Brazil coffee areas. The banana, yam, manioc, maize, poultry, and goat are the staple of food.

Nearly all the vast territory is now held by European powers, who are trying to develop commerce. The climate nearly everywhere is very unhealthful. Human porterage is the only means of transportation in large regions.

Only three states of tropical Africa are independent. Liberia (Fig. 154) is a negro republic, inhabited by over 20,000 colonists from this country and perhaps 1,000,000 natives. The colonists are farmers, living on the coast or along the rivers not far inland. Most of the country is covered with heavy forests, the products of which, together with palm oil and coffee of excellent quality, are the chief exports. Monrovia is the capital and chief seaport.

The Belgian Congo embraces the larger part of the Congo basin (Fig. 157). Over 2,000 white men in the service of the state, trading companies, and missionary societies are scattered through the country. Boma is the capital, and Banana, Boma, and Matadi are the ports. The chief export is rubber, the state being the largest source of African rubber. It is gathered by natives mainly in the upper Congo region, each village chief being compelled to supply a certain quantity. It is a misdemeanor to kill the rubber vines, the natives having been taught to tap them, so that the wound may heal and the plant produce again.

COMBINED HARVESTER AND THRESHER IN WASHINGTON.

The planting of vines is also compulsory. The second largest export is ivory. Most of the ivory now reaching the markets comes from this state, a large part of it being what is known as "dead ivory"; in other words, tusks that were accumulating in the country long before the natives met the whites and learned that ivory had commercial

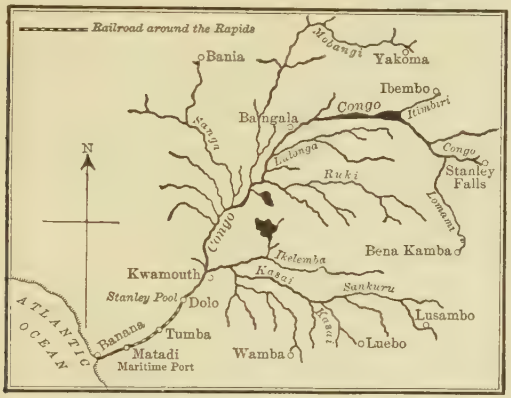


FIG. 157.—This map shows the Congo River and its tributaries only as far as they are navigable. Steamships from Antwerp and Rotterdam ascend the Congo 90 miles to Matadi at the foot of the rapids, which interrupt navigation to Stanley Pool, a distance of 235 miles. A railroad around the rapids connects Matadi with Dolo, on Stanley Pool. This is the starting point for a fleet of over 100 steamboats which ascend the Congo and its affluents, the total navigation above Stanley Pool being about 7,000 miles. These steamboats carry supplies to the numerous stations of the Belgian Congo and French Congo, and to the trading and missionary posts that are scattered along the navigable water ways, and bring down the stores of Upper Congo ivory, rubber, and palm oil that are transshipped to the cars at Dolo. The principal stations of the Belgian Congo are shown.

value. Palm nuts and palm oil, much of them gathered far up the Congo, are the only other exports of importance. The imports are supplies for the stations and cotton textiles, etc., for the natives.* This state is making great progress in trade and in teaching the natives.

* Throughout tropical Africa the sale of firearms or spirituous liquors is now restricted to regions in which the trade had long been established. "Mericani," cheap cotton cloth made in this country, is

Abyssinia, a native kingdom, mostly 8,000 feet above the sea, is beginning to be of some importance in foreign trade. The chief commercial town is Harar, which is being connected by a railroad with the French port of Jibuti. Nearly all the imports are textiles, about half the entire purchases being American unbleached cottons. The chief exports are coffee, ivory, civet (an animal substance used as a perfume), gold, wax, and goatskins.

To avoid repetition, it may be said that the exports of all the west coast colonies, from Senegal to the Congo, consist mostly of palm oil, palm kernels, groundnuts, kola nuts, copal (a resin used for varnishes), other gums, rubber, and a little coffee and ivory. The imports are cotton tissues, cutlery, and other articles, including firearms and spirits, where they are admitted.

Among the more important colonies are Senegal (Fig. 154), the outlet of the French Sudan, with a fine harbor at Dakar, which is connected by rail with St. Louis, the capital. The Senegal River is navigable for 400 miles, and a railroad is building to connect the head of navigation with Bammako on the Niger. Steamboats ply on that river from Bammako to below Timbuktu, but two stretches of rapids interrupt navigation in its lower course. Freetown, the capital of the British colony of Sierra Leone, has 138 inches of rain a year and is very unhealthful. It is being connected by railroad with the interior. Grand Bassam is the chief trading center on the Ivory Coast (French), which produces a little gold. This metal is also found along the streams of Ashanti (British), where profitable mining might be carried on if it were not for the trying climate. Accra is the most important town. Togoland (German) has a remarkable supply of the oil palm. Dahomey (French), having been

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very popular throughout tropical Africa, large quantities being sent direct or through England and other countries having African possessions.

freed from the evils of human sacrifices and slave-raiding, now has some legitimate trade with the mother country. Lagos is the finest British colony on the coast, with a very large trade in palm oil. The population is dense for some distance inland. The town of Lagos is the chief commercial center of West Africa. The British Sudan (Nigeria) has its outlet by the Niger and its Benue tributary, and includes the leading commercial and manufacturing towns of the Sudan, as Sokoto, Kano, and Katsena. The Cameroons (German) is a very large colony, in which the Germans are opening plantations of cacao, coffee, and tobacco, besides dealing in native products. The French Congo extends to the middle of the continent along the north bank of the Mobangi River, but it has as yet only a fourth as much trade as the Belgian Congo. Loango is the chief port. Brazzaville, the capital, at Stanley Pool, is the starting point of many steamers.

The large colony of Angola has three important seaports, Loanda, Benguela, and Mossamedes. Loanda is the second largest commercial town on the west coast. The railroad now in operation to Ambaca is to be extended to Malanje. Rich plantations stretch along the railroad, the exports of vegetable oils, rubber, wax, cocoanuts, and coffee making Angola the most productive Portuguese colony. Practically all the trade, amounting to $5,000,000 exports and about $3,700,000 imports a year, is with the mother country. German Southwest Africa is healthful, mostly arid, but with rich resources in copper and other metals, and with some advantages for grazing, and also for agriculture, where irrigation is possible. German colonists and Boer refugees from the Transvaal are settling in the most favorable districts.

Portuguese East Africa has the best harbor of the continent at Lorenzo Marquez in Delagoa Bay. It is connected by rail with Pretoria and Johannesburg, and does a very large transit business to and from the Transvaal.

A railroad extends from the port of Beira to Salisbury in the British possessions, giving a short outlet to the gold fields of Mashonaland. Quilimane and Mozambique are other important ports. Ocean vessels can enter the Chinde branch of the Zambesi delta, but rapids obstruct river navigation about 200 miles from the mouth of the river. The chief imports are cottons and spirits.

British Central Africa is almost entirely undeveloped, but large progress has been made in the Central Africa Protectorate, where fine coffee plantations have been opened near the south end of Lake Nyassa, and rice, oats, and barley thrive. Blantyre is a large town, with industrial schools where trades are taught to the natives.

German East Africa extends from the Indian Ocean to Lake Tanganyika. Though in the early stages of development, the Germans have opened, a little inland, large plantations of coffee, cocoanut palms, vanilla, tobacco, rubber, and cacao, and have started from the coast at Tanga a railroad which will ultimately extend to the great lakes. Subsidies are granted to railroads and steamboats, and the Government is promoting enterprise in various directions. British East Africa is building a railroad from its chief port, Mombasa, to Victoria Nyanza. Steamboats ply on Victoria Nyanza, Lake Tanganyika, and Lake Nyassa.

The largest African island is Madagascar, a French possession. French cotton textiles are the chief imports, a preferential tariff in favor of France reducing the imports from other countries. The chief exports are rubber, wax, hides, gold, and vanilla. Mauritius (British) and Réunion (French) produce cane sugar. Zanzibar, on the island of that name, is the great trade center for east equatorial Africa, most of the exports being sent to that city for shipment; imports are forwarded from Zanzibar by the inland caravan routes. The island, with the neighboring island of Pemba, supplies a large part of the cloves in the markets.

St. Vincent, in the Cape Verde Islands off West Africa, is a Portuguese coaling station; the Madeira Islands (Portuguese) export wine; La Luz, in the Canaries, is a coaling station for steamers in the South African trade; the Azores, far out in the Atlantic on the route from New York to Gibraltar, are visited by an average of a steamer a day to recoal.

TROPICAL AFRICAN COUNTRIES

Foreign Trade

Belgian Colony of the Congo, 1908

Imports	$11,772,000	Exports	$20,047,800

Liberia, in 1908

Imports	$1,200,000	Exports	$913,500

German East Africa, 1908

Imports	$6,446,000	Exports	$2,718,464

NOTES

In many respects man can not mitigate the effects of climate. Cattle and sheep are raised in parts of west tropical Africa, but only hides and horns figure in the exports. These animals do not fatten well in such a climate, and the sheep have hair instead of wool. Excessive and persistent heat kills the animal industries and brings jungle products, such as rubber, vegetable oils, and fibres, to the front.

But on the somewhat cooler interior plateau of the Congo state the Belgians have introduced European cattle at many stations, and the prospects of their usefulness appear encouraging.

CHAPTER XLVII

TEMPERATE SOUTH AFRICA

The elevation of South Africa above the sea has important effect upon its industries and commerce (Fig. 158). Most of the vast plateau, rising from 3,000 to over 5,000 feet above sea level, has a cooler climate than many other parts of the world similarly distant from the equator. Although Cape Town and Port Elizabeth are at the south end of Africa, they are nearer the equator than is Memphis, Tenn.; the region north of them, still nearer the equator, would not be adapted to become the home of millions of whites if the altitude did not provide comparatively temperate conditions.*

More than half of South Africa is deficient in rainfall (Fig. 3). The effect of this condition upon density of population is shown in Fig. 22. The semi-arid area includes the entire western half of the country, which is dry, because South Africa depends for rain upon winds from the Indian Ocean, and the eastern coast lands and highlands receive the larger part of this precipitation as the winds move westward; so that more than half of South Africa will never be adapted to support a dense white population, though it may develop large mining and stock-raising, and also agriculture where irrigation is possible. The eastern

* Rio de Janeiro is a tropical city, but Johannesburg, in nearly the same latitude, enjoys a temperate climate. Many Englishmen, with their wives and children, are thriving on their stock and wheat farms near Salisbury, in southern Rhodesia, though they are seven degrees of latitude nearer the equator than the south end of Florida.

FIG. 158.—SOUTH AFRICA.

None of the ports, except Lorenzo Marquez, is naturally a good harbor. Immense sums have been spent to make them fairly safe and convenient for shipping. Cape Town, the capital of Cape Colony, is at a corner of the country inconveniently situated for the business of the interior. It is the leading port of South Africa only with respect to the export of gold and diamonds, which it nearly monopolizes. Excepting gold and diamonds, more of the things that South Africa sells to the rest of the world or buys from it pass through Port Elizabeth than through any other port. East London, on the Buffalo River, is not easy to reach in certain stages of the wind, but is the second wool port. Durban, the chief city of Natal, has a large landlocked harbor, but is too shallow for steamships of deep draught. It exports most of the wool of the Orange River Colony. British and German capital has built docks and warehouses at the Portuguese port of Lorenzo Marquez, which is a large forwarding port for trade to and from the Transvaal. All these ports are connected by rail with the principal points of development in the interior. Swakopmund, the port of German Southwest Africa, is near the better port of Walfish Bay, which is a British possession. As a result of the war with the two Boer republics, Great Britain has added them to its colonial possessions under the names of the Orange River Colony and the Transvaal Colony. Johannesburg, with 158,000 inhabitants, is the largest city in South Africa.

part, however, and also a narrow strip across the south end, are adapted for the cereals, fruits, and other vegetable products of temperate or subtropical climates. The east and south, therefore, provide the breadstuffs and wine; the high, dry plains of the west, with an abundance of nutritious herbage in spite of the scanty rainfall, supply the larger part of the animal products. Because the opportunities for grazing are larger than for farming, the exports of wool and hides are enormous, while imports of wheat and some other farm crops are considerable.

Observe the distribution of the agricultural and grazing industries (Fig. 158). Wheat is grown, northwest of Cape Town, only with the aid of irrigation; but stretching across the south end of Africa is a strip of fine farming lands, where wheat, maize (known as mealies, a large food staple), and all the crops of the temperate zone are very successful. The best of wheat is also grown along the southern border of Orange River Colony.

East and northeast of Cape Town, on the northern slopes of the hills (p. 15), are thousands of acres of grapes. Cape Colony is becoming one of the large wine countries, millions of gallons being produced every year. Some of the wines are of high quality, but the industry, as a whole, has not yet received the intelligent development it needs. In February and March, when the grapes reach their greatest perfection, enormous quantities of clusters are carefully packed, placed in cool rooms on the steamers, and sent to Great Britain, where the fresh fruit, in the early spring, is much esteemed. Delicious peaches, nectarines, and plums are also sent fresh to the British spring markets almost before English fruits are in blossom.

East of the vine region and north of the cereal belt is quite a large area peculiarly adapted for tobacco culture, so that South Africa produces much of the tobacco it consumes. East of the tobacco fields is a region of brush and scrub, known as the bush country, which has developed an

industry almost peculiar to South Africa—the raising of ostriches for their feathers.

Ostrich culture is one of the large industries. Ostrich feathers are surpassed only by wool and the hair of the Angora goat in the exports of animal products.* The business of domesticating and raising ostriches was experimental at the start, and has had many vicissitudes which induced the smaller growers to abandon it, the industry being now centered mainly in the hands of men of considerable capital. The most valuable feathers, plumes from the wings and tail, are sometimes worth as much as $200 a pound. Ordinary feathers are worth from $5 to $7 a pound.

Wool-growing is the largest grazing industry. South Africa is one of the large wool-growing regions (Fig. 54), the product being usually known in the trade as Cape wool. North of the region of vines, tobacco, and ostriches stretch away the great high plains whose herbage is particularly relished by sheep. About 12,000,000 of them are feeding on the plains from the Great Karroo northward; 4,000,000, before the recent war, were herding on the high, cool plains of the little Orange Free State. Only Australasia and the Rio de la Plata countries surpass South Africa in the quantity of wool exported. Both native and merino sheep are raised, the native predominating on the northwest grazing lands, while the merino is preferred in the Great Karroo, where the industry has its largest importance. The foreign sales are more than double the value of any other exported commodities, excepting gold and diamonds.

Goats are much more numerous than cattle. The most important in commerce is the Angora goat, which was brought to the Cape from Anatolia (Asia Minor) about the middle of the last century. The mohair (exports, about

* About 1875 the statistics of Cape Colony said: "There are ten tame ostriches in this colony." There are now more than 350,000 birds on the ostrich farms of the bush country. The exports, steadily increasing in recent years, amounted in 1904 to 389,000 pounds of feathers.

$3,300,000 a year) has the reputation of surpassing that of Anatolia in fineness and softness of texture, though not equaling it in luster. The industry is mainly centered in the east of the Great Karroo around Graaf Reinet.

Most of the cattle are raised on the coast lands, which are too wet for sheep and goats, and in the middle veldt of the Transvaal, where the Boers, on their enormous farms, raise large herds. Much of the transport of South Africa is still dependent upon the slow ox wagon; the demand for oxen, therefore, is very large. Hides are among the important exports.

Natal is unique in two of its agricultural industries. It is the only colony producing sugar and tea. Cane sugar is its principal product, the output being about 27,000 tons. The tea industry, yielding 3,000,000 pounds in 1908, is rapidly growing; the planters have high hopes of soon entering the foreign markets with good teas grown much nearer the great consuming countries than the present sources of supply. Indian coolie labor is employed on the sugar and tea plantations. Much of the sugar is exported, but South Africa is the market as yet for all the tea raised.

Gold exceeds in value all the other exports together.* This is due to the wonderful development of gold mining in the Transvaal, and particularly on the Witwatersrand around Johannesburg (Fig. 158). The Witwatersrand (White River Slope) is a slightly elevated ridge, the water parting between two river systems, about 125 miles in length and one mile to one and a half miles in width. The mines thus far opened extend about twenty-five miles along the rand. This small area, in 1908, produced more gold than any other country.† Yield, 1908, $140,000,000.

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* This statement is based upon normal conditions, not upon those imposed by war, which in 1900 reduced the gold output $65,000,000 below the figures of the previous year.

† Some of the mines have been sunk to a depth of 2,500 feet, and experts say the ore may be profitably mined to a greater depth. The

Diamonds are the second largest export (p. 133). Rough stones to the value of over $30,000,000 are sent from the Kimberley and Transvaal mines every year. Ninety-eight per cent. of the diamonds of commerce come from the mines of South Africa, and several other profitable diggings in that region were abandoned as soon as the surpassing richness of the Kimberley mines was discovered. The large production threatening to overstock the market and reduce the price led (1887) to the consolidation of the four leading mining companies, which absorbed the smaller concerns till all the interests were consolidated under one management. No more diamonds are mined than the market will take at a good price. London buyers attend the sale of rough stones at Kimberley in March every year. The fact that all dealers know the quantity of new diamonds that has gone into the trade, and that no further sales will occur for a year, tends to keep the market on a stable basis.

The development of the gold fields of southern Rhodesia, which are said to cover an area of about 5,000 square miles, is not far advanced, but the early stages of the work give much promise for the future. The valuable copper mines near the west coast are made accessible by a railroad from Port Nolloth. Coal is the only other mineral worked to an important extent, mainly in Natal; the fact that large beds of iron ore are found near the Natal coal is favorable for the future development of manufactures, which can scarcely be said to exist in South Africa at present, except in relation to the products of the vineyards, farms, and pastures.

Practically all the exports go to Great Britain. The gold, diamonds, wool, hides, mohair, wine, and ostrich feathers that South Africa sells reach other countries to a consider-

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work is entirely carried on by foreign capital. The Boer Government, through the taxes imposed upon the mining industry, became one of the richest governments in the world, in proportion to population.

able extent, but mainly through the channels of British commerce. On the other hand, a great many commodities are purchased from various nations. In 1908 South Africa purchased from this country $7,300,000 worth of goods, including wheat and flour, machinery, agricultural implements, hardware, lumber, and naval stores. Nearly all the textiles come from England. As the country has very little timber, wood products of all kinds are imported. Foreign tobacco, largely from this country, supplements the home supplies. While hides are a leading export, leather, boots, and shoes are purchased in large quantities. South Africa has the raw materials and favorable climatic conditions for supplying a large part of its need for manufactured commodities. The fact that so little attention has been paid to this form of development is largely due to the comparative sparsity of the white population, which has been fully occupied with the work of opening up the natural resources of the country.

STATISTICS FOR SOUTH AFRICA

Cape Colony: Population, 2,409,804 (579,741 whites). Imports (1908), $80,656,000; exports, $210,593,000.

Natal: Population, 1,206,000. Imports (1908), $51,980,000; exports, $11,789,000.

Transvaal Colony: Population, 1,337,227. Imports (1908), $80,983,000; exports, $166,618,000.

STATISTICS OF THE PRINCIPAL COUNTRIES

Year.	Country.	Area (in thousand sq. miles).	Population (in thousands).	Density (to the sq. mile).	Imports (in million dollars).	Exports (in million dollars).
1908..	Argentina.....	1,139.2	6,100.0	5.3	263.4	353.2
1908..	Australia.....	2,974.5	4,222.0	1.4	242.3	302.3
1908..	Austria-Hungary	261.2	50,499.0	193.3	486.8	457.8
1908..	Belgium	11.4	7,386.0	649.4	642.2	483.7
1908..	Bolivia.....	567.6	1,954.0	3.4	20.8	24.0
1908..	Brazil.....	3,291.4	21,000.0	6.4	172.3	214.3
1908..	Bulgaria.....	37.2	4,158.0	111.1	25.1	21.7
1909..	Canada	3,729.6	7,184.0	1.9	298.2	222.0
1908..	Chile	292.7	3,254.0	11.1	97.6	116.5
1908..	China Proper....	4,360.7	330,130.0	76.8	254.5	178.5
1908..	Colombia.....	435.3	4,320.0	9.9	13.5	14.9
1908..	Costa Rica.....	18.7	360.0	19.2	5.6	7.7
1908–9	Cuba	45.8	2,049.0	44.6	83.9	115.6
1908..	Denmark.....	15.6	2,630.0	168.6	190.7	165.3
1908..	Ecuador.....	118.6	1,272.0	10.7	10.0	12.9
1908..	Egypt.....	383.9	11,287.0	29.4	119.8	103.5
1908..	France.....	207.1	39,300.0	189.7	1,088.6	974.7
1908..	Germany.....	209.7	63,219.0	301.3	1,824.0	1,522.8
1907..	Greece.....	24.9	2,632.0	105.4	28.7	22.7
1908..	Guatemala.....	43.6	1,883.0	43.1	5.8	6.8
1907–8	Haiti.....	11.0	1,800.0	162.5	4.7	3.5
1908..	Honduras.....	44.2	500.0	11.3	2.7	1.8
1908–9	India.....	1,766.5	294,361.0	166.6	417.8	486.0
1908..	Italy.....	110.6	34,270.0	309.6	562.3	333.7
1909..	Japan.....	147.7	49,233.0	33.3	196.3	205.7

STATISTICS OF THE PRINCIPAL COUNTRIES—(*Continued*)

Year.	COUNTRY.	Area (in thousand sq. miles).	Population (in thousands).	Density (to the sq. mile).	Imports (in million dollars).	Exports (in million dollars).
1907..	Korea.....	84.4	9,782.0	115.8	20.3	8.2
1908–9	Mexico.....	767.3	15,000.0	19.5	77.9	115.0
1908..	Netherlands.....	12.7	5,825.0	457.1	1,129.5	872.9
1908..	New Zealand....	104.7	942.0	8.9	85.0	77.3
1908..	Nicaragua.....	49.5	460.0	9.2	3.0	4.5
1908..	Norway.....	124.7	233.0	18.6	100.8	64.3
1907..	Paraguay.....	97.7	631.0	6.4	3.9	3.7
1908–9	Persia.....	635.1	9,500.0	14.9	31.0	25.9
1908..	Peru.....	683.3	4,560.0	6.6	25.7	26.1
1907..	Portugal.....	35.4	5,423.0	152.7	66.3	32.8
1907..	Rumania.....	50.7	6,684.0	131.8	83.0	106.9
1907..	Russian Empire.	8,374.1	149,034.0	17.8	436.4	542.3
1908..	Salvador.....	8.1	1,707.0	208.9	4.2	5.9
1908..	Santo Domingo..	18.7	610.0	32.5	4.9	9.6
1908..	Servia.....	18.6	2,825.0	151.4	14.2	15.0
1908–9	Siam.....	195.0	6,687.0	34.3	27.8	36.5
1908..	Spain.....	194.8	19,713.0	101.2	167.8	153.2
1908..	Sweden.....	172.9	5,378.0	31.1	163.2	129.1
1908..	Switzerland.....	15.9	3,559.0	223.0	287.0	200.4
1905–6	Turkish Empire.	1,153.5	24,082.0	20.8	135.2	84.8
1908..	United Kingdom	121.3	44,547.0	367.2	2,885.6	1,835.1
1908–9	United States (Continental)	3,025.0	(1910) 91,972.3	30.9	1,312.0	1,638.3
1908..	Uruguay.....	72.2	1,043.0	14.4	34.6	37.3
1908..	Venezuela.....	363.8	2,647.0	7.2	10.2	14.6

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